

# **Vol. I**

## **TRANSCRIPT OF RECORD.**

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**SUPREME COURT OF THE UNITED STATES.**

**OCTOBER TERM, 1922.**

**No. 278.**

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**LAYNE & BOWLER CORPORATION, PETITIONER,**

**vs.**

**WESTERN WELL WORKS, INC.; ROTARY DRILLING AND  
DEVELOPMENT COMPANY, STANLEY M. HALSTEAD,  
ET AL.**

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**ON WRIT OF CERTIORARI TO THE UNITED STATES CIRCUIT COURT  
OF APPEALS FOR THE NINTH CIRCUIT.**

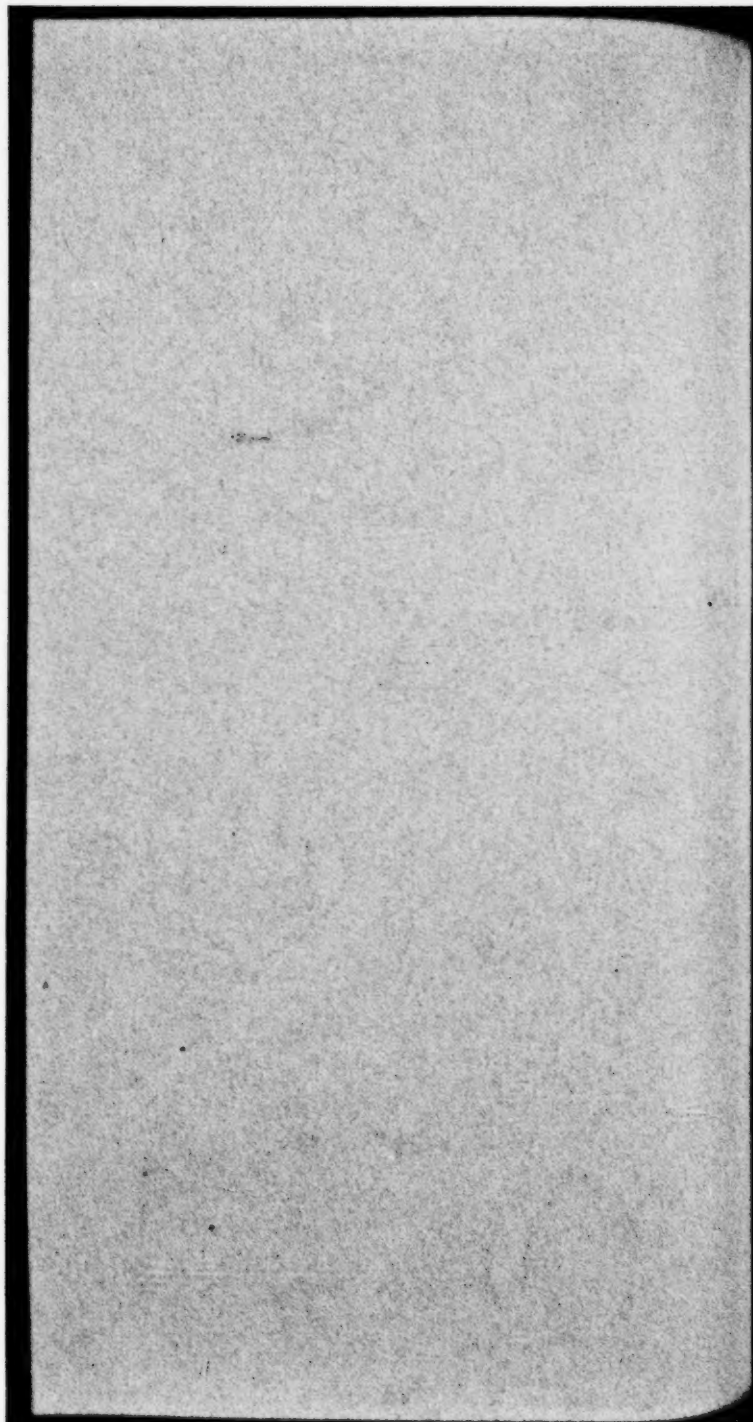
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**PETITION FOR CERTIORARI FILED FEBRUARY 24, 1923.**

**CERTIORARI AND RETURN APRIL 24, 1923.**

**(28,729)**





(28,729)

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In the Southern Division of the United States District Court for the Northern District of California, Second Division.

IN EQUITY.

FOR INFRINGEMENT OF LETTERS PATENT  
No. 821,653.

LAYNE & BOWLER CORPORATION,  
Plaintiff,

vs.

WESTERN WELL WORKS, INC. (a Corporation), ROTARY DRILLING & DEVELOPMENT COMPANY (a Corporation), STANLEY M. GALSTEAD, P. E. VAUGHAN, and ALLEN W. ROSS,

Defendants.

**Bill of Complaint.**

Comes now Layne & Bowler Corporation, plaintiff above named, and files this, its bill of complaint,



against Western Well Works, Inc. (a corporation), Rotary Drilling & Development Company (a corporation), Stanley M. Halstead, P. E. Vaughan, and Allen W. Ross, defendants above named, and alleges:

I.

That this is a suit in equity arising out of and under the patent laws of the United States, and the jurisdiction of the Court is based upon the said patent laws and the infringement of letters patent issued thereunder.

II.

That plaintiff, Layne & Bowler Corporation, is now, and for years last past has been, a corporation duly organized and existing under and by virtue of the laws of the State of California with its principal place of business at Los Angeles, California. [1\*]

III.

That defendant, Western Well Works, Inc. (a corporation), is now, and since on or about April 15, 1915, has been, a corporation duly organized and existing under and by virtue of the laws of the State of California, and has had, and now has, its principal place of business at the city of San Jose, in the county of Santa Clara, in the State of California; that defendant, Rotary Drilling & Development Company, is now, and since on or about March 20, 1919, has been, a corporation duly organized and existing under and by virtue of the laws of the State of California, and has had, and has, its principal place of business in the City of San Jose, County of Santa Clara, State of California; that defendants, Stanley

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\*Page-number appearing at foot of page of original certified Transcript of Record.

M. Halstead and P. E. Vaughan, are each residents and citizens of the city of San Jose, Santa Clara County, California; and that defendant, Allen W. Ross, is a resident and citizen of Burlingame, State of California.

IV.

That heretofore and prior to the 28th day of April, 1903, Mahlon E. Layne, was the true, original and first inventor of certain new and useful improvements in well mechanism not heretofore known or used in this country or patented or described in any printed publication in any country before his said invention thereof, and which had not, for more than two years prior to the date of his application for patent hereinafter set forth, been so patented or described or been in public use or on sale in this country, and which had not been patented on an application filed in any country foreign to the United States, by said Mahlon E. Layne, his legal representatives or assigns more than twelve months prior to the date of his application for patent hereinafter set forth, and which had not been abandoned to the public. [2]

V.

That said Mahlon E. Layne, being as aforesaid, the true, original and first inventor of said improvements and being a citizen of the United States, made application to the Commissioner of Patents of the United States in legal form for letters patent on said improvements, and that after due proceedings had, the Commissioner of Patents issued to said Mahlon E. Layne, in due form a patent for said invention, numbered 821,653, and dated May 29, 1906, the same being delivered to said Mahlon E. Layne under seal

of the patent office of the United States, signed by the Commissioner as by law directed, and that said patent granted and secured to said Mahlon E. Layne and his assigns for the term of seventeen years from and after said date of the patent the full and exclusive right to make, use and sell to others to be used the said invention and improvements set forth in the patent, a copy of which said letters patent is attached hereto and of which said Mahlon E. Layne stands ready to produce the original or a certified copy thereof, as your Honors may direct.

#### VI.

That by a regular chain of assignments in writing, duly executed by the parties thereto and duly delivered, said Mahlon E. Layne sold, assigned, transferred and set over unto plaintiff Layne & Bowler Corporation the full and exclusive right, title and interest in and to said letters patent No. 821,653 aforesaid and in and to the invention thereby described, set forth and claimed therein, for, to and in the State of California, and in and to all rights of action, claims or demands arising out of or accruing from past infringement of said letters patent within the State of California, and plaintiff now is the owner of the exclusive right, title and interest in and to said [3] invention and letters patent and all rights thereby granted and secured or accruing or arising out of the same, for, to and in the State of California.

#### VII.

That immediately after the production of said invention by Mahlon E. Layne the said invention went

into great and extended use and said Mahlon E. Layne and his various licensees and this plaintiff have sold large numbers of well mechanism embodying and containing the said invention patented in and by said letters patent and particularly as embraced in claims 9 and 20 thereof; that upon each and every of such well mechanism or pumps so embodying the said invention manufactured or sold or used by said Mahlon E. Layne or any of his licenses or by this plaintiff there has been plainly marked the word "Patented," together with the day and date of issuance of said letters patent, to wit, May 29, 1906.

### VIII.

That said Mahlon E. Layne and his licensees, and this plaintiff since acquiring the right to said invention and letters patent for, to and in the State of California, have expended large sums of money and have been to great trouble with and about said invention for the purpose of carrying on the business of manufacturing and selling well mechanism containing and embodying said invention and making said invention profitable to them and each of them and to the public; that well mechanism have been made and sold in great numbers by them and each of them to the public, and that the public has generally acknowledged and acquiesced in the aforesaid rights of each of them and of plaintiff thereunder and thereto, and that but for the unlawful and wrongful infringement thereof hereinafter complained of plaintiff would realize and would have received large gains, [4] advantages and profits therefrom if the said infringement of defendants were prevented.

## IX.

That heretofore and on or about the first day of April, 1908, said Mahlon E. Layne filed in the United States Circuit Court for the Southern District of Texas his bill of complaint in equity against El Campo Machine Company and W. T. Gray as defendants alleging the invention of said invention by said Mahlon E. Layne and the grant and issuance of said letters patent to him therefor and the infringement thereof by said defendants; that defendants duly answered in said suit; that said suit was transferred to the United States Circuit Court for the Eastern District of Texas; that a final hearing was had in said suit upon proofs adduced upon behalf of the parties; that said United States Circuit Court for the Eastern District of Texas thereafter made, filed and entered in said suit its decree finding that said Mahlon E. Layne was the original, first and true inventor of said invention and particularly as set forth in claims 9, 13 and 20 of said letters patent, and that said letters patent were valid; that thereafter said defendants El Campo Machine Company and W. T. Gray appealed from said decree to the United States Circuit Court of Appeals for the Fifth Circuit; that said appeal was duly heard upon a full transcript of the record in said case; that said United States Circuit Court of Appeals for the Fifth Circuit thereafter, to wit, on or about April 4, 1912, rendered its opinion or decision upon said appeal in which it affirmed said decree of the Circuit Court of the United States for the Southern District of Texas and found that said letters patent were good and valid in law and found that the appellant had in-



fringed the 13th claim of said letters patent, all as will more fully and at large appear from the original [5] bill of complaint, answer of defendants, decrees of said courts and transcript of the record of proceedings in said suit, or duly certified copies thereof ready in Court to be produced as may be required.

X.

That during the year of 1911 said Mahlon E. Layne and Layne & Bowler Company, a Texas Corporation, filed their certain bill of complaint in the United States District Court for the Western District of Louisiana against Marvin B. Van Ness, said suit being known as No. 696 in Equity, for infringement of said letters patent No. 821,653; that defendant Van Ness duly answered therein; that said suit in equity was heard upon due proof taken on behalf of the parties; that said United States District Court for the Western District of Louisiana after a final and complete hearing in said suit made and entered its decree finding and adjudging that said Mahlon E. Layne was the original, first and sole inventor of said invention, and that said letters patent were valid, and particularly finding that claims 4, 9, 13 and 20 thereof were valid, and that defendant had infringed thereon; that defendant Marvin B. Van Ness took an appeal from said decree to the United States Circuit Court of Appeals for the Fifth Circuit; that said United States Circuit Court of Appeals for the Fifth Circuit heard and determined said appeal after full argument and rendered its opinion on or about April 16, 1914, finding that said letters patent were good and valid in law, particularly as to claims 9 and 20,

all as in and by said original bill of complaint, answer, transcript of record and proceedings in said courts, decrees and opinion of the Court, or duly certified copies thereof ready in court to be produced, will more fully and at large appear; that the opinion of the said Circuit Court of Appeals for the Fifth Circuit in said case [6] is reported in Vol. 213 of the Federal Reporter commencing at page 804.

### XI.

That on or about July 1, 1912, said Mahlon E. Layne and said Layne & Bowler Company, a Texas corporation, filed their bill of complaint against United Well Works, an Arkansas corporation, and J. R. Pennington and W. I. Porter alleging infringement of said letters patent No. 821,653; that defendants answered therein and after a final hearing thereof upon due proofs on behalf of the parties said United States District Court for the Western District of Arkansas made, filed and entered its decree finding said letters patent valid in law and particularly as to claims 9 and 20 thereof and adjudged the same infringed by defendants; that defendants took an appeal to the United States Circuit Court of Appeals for the Eighth Circuit from said decree; that said appeal was duly heard and considered by said United States Circuit Court of Appeals for the Eighth Circuit and said decree affirmed particularly as to claims 9 and 20 of said letters patent and as in and by said original bill of complaint, answer, proofs and record and said respective decrees or duly certified copies thereof will more fully and at large appear.

XII.

That thereafter said Mahlon E. Layne and said Layne & Bowler Company (a Texas corporation), filed their bill of complaint in equity in the United States District Court for the Western District of Louisiana against Fred I. Getty for infringement of said letters patent and particularly as to claims 9 and 20 thereof; that defendant duly answered therein and proofs, testimony and evidence upon behalf of the parties were [7] duly taken in said suit, and said suit was known as No. 925 in Equity; that said cause came on for final hearing on December 10, 1918, and was duly argued by counsel for the respective parties; that thereafter said District Court of the United States for the Western District of Louisiana decided said suit and rendered its opinion therein, ordering and directing a decree in favor of plaintiffs finding that said letters patent were valid and claims 9 and 20 infringed; that thereafter a decree was entered in said suit adjudging that said letters patent No. 821,653 were valid in respect to claims 9 and 20 thereof, that said Mahlon E. Layne was the first, true and original inventor of the invention and improvement described and claimed in claims 9 and 20 respectively thereof; that defendant Getty had infringed upon the exclusive rights of plaintiffs under claims 9 and 20 of said patent, and awarding a perpetual injunction and an accounting of profits and damages, all as in and by said original bill of complaint, answer, proofs, record and evidence, opinion of the Court and decree, or duly certified copies thereof ready in court to be produced will more fully and at large appear.

## XIII.

That at divers times on and between April 15, 1915 and the filing of this bill of complaint defendant Western Well Works, Inc., and defendants Stanley M. Halstead, P. E. Vaughan and Allen W. Ross have jointly, and without the license or consent of this plaintiff, unlawfully and in infringement of the exclusive rights of this plaintiff under and by virtue of said letters patent and within the State of California, to wit, at San Jose, in the County of Santa Clara, State of California, and elsewhere in the State of California, made, used and sold, and caused to be used used and caused to be sold, divers and sundry [8] well mechanism embodying and containing the said invention patented in and by said letters patent No. 821,653, and particularly as embraced in claims 9, 13 and 20 thereof; that each of the well mechanism so manufactured, sold or used or caused to be made, sold or used by defendants or either thereof as aforesaid has contained within it the same invention patented in and by said claims 9, 13 and 20 respectively of said letters patent, and at divers times since March 20, 1919, without the license or consent of plaintiff, and within the State of California, to wit, at San Jose, Santa Clara County, California and elsewhere, said defendant Rotary Drilling & Development Company (a corporation) conspiring with said defendant Western Well Works, Inc., Stanley M. Halstead, P. E. Vaughan and Allen W. Ross, has made and caused to be made, sold and caused to be sold, used and caused to be used, well drilling mechanism embodying and containing said invention patented in and by said letters patent and particularly as specified and

set forth in claims 9, 13 and 20 thereof, but for how long exactly or to what extent exactly each or any of said defendants have been so doing plaintiff is not informed and prays discovery thereof; that thereby plaintiff has suffered great damage and injury and said defendants and each of them have realized great profits from said wrongful and infringing acts and plaintiff prays that said defendants and each of them be ordered, adjudged and decreed to account for and to pay over to plaintiff all of such profits and advantages so realized by them or each of them from said wrongful and infringing acts and to pay to plaintiff all damages suffered by plaintiff by reason of such unlawful and infringing acts.

XIV.

That defendants Stanley M. Halstead and P. E. Vaughan are the owners of all, or substantially all, of the stock of said defendant Western Well Works, Inc., and are managing [9] and controlling said Western Well Works, Inc., and directing its business and particularly directing its infringing acts aforesaid; and that for a valuable consideration had and received by said defendants Stanley M. Halstead and P. E. Vaughan from this plaintiff and in consideration of certain rights and privileges granted to them said defendants Stanley M. Halstead and P. E. Vaughan did on or about October 1, 1914, enter into a certain contract or written agreement with plaintiff respecting the sale of well mechanism manufactured by plaintiff and containing the said patented invention and particularly the invention covered by and embraced within claims 9, 13 and 20 of said letters patent No. 821,653; that in and by said



written instrument and as a part thereof said defendants Stanley M. Halstead and P. E. Vaughan did covenant and agree that they, and each of them would and did acknowledge the validity of said letters patent No. 821,653 aforesaid, and the title of plaintiff therein and thereto in and throughout the State of California, Arizona and New Mexico and did acquiesce in and agree to acquiesce in said patent throughout the life of said patent, to wit, during the whole term thereof, and did covenant and agree that the term "enclosed line shaft" or the term "a closed casing surrounding the pump shaft from the pump to the top of the well" means and embraces any pump shaft for a deep well centrifugal pump, which is surrounded by a casing extending substantially from the pump to the top of the well and is provided with bearings for the shaft along its length, and which casing is sufficiently closed to allow feeding of a lubricating fluid down through said casing to the various bearing parts for the shaft therein; that, notwithstanding such acknowledgment of the validity of said patent and such acquiescence in the validity thereof, and such covenant as to the meaning and scope thereof, defendants Stanley M. Halstead and P. E. Vaughan conspired [10] together to manufacture in the State of California, sell and use pumping mechanism embodying the invention patented in and by said letters patent No. 821,653, and embraced within claims 9, 13 and 20 thereof and including the enclosed line shaft or a closed casing surrounding the pump shaft from the pump to the top of the well as so interpreted by said contract, all with the intent of appropriating to themselves the

business of this plaintiff in manufacturing, selling and using well mechanism containing said invention, all without the license or consent of plaintiff; and upon information and belief plaintiff alleges that said defendants Stanley M. Halstead and P. E. Vaughan caused the defendant Western Well Works, Inc., to be incorporated for the purpose of and to cause said Western Well Works, Inc., to engage in the manufacture and sale within the State of California of well mechanism embodying and containing the patented invention embraced and covered by said claims 9, 13 and 20 thereof; that said defendants Stanley M. Halstead and P. E. Vaughan have directed and still do direct the business of said Western Well Works, Inc., and control the same and cause the said Western Well Works, Inc., to manufacture and sell in the State of California well pumping mechanism embodying and containing said patented invention in defiance of the exclusive rights of plaintiff in and under said letters patent aforesaid; that in furtherance of said conspiracy and to enable defendants Stanley M. Halstead and P. E. Vaughan to more fully and completely carry on said infringement said defendants Stanley M. Halstead and P. E. Vaughan caused the said Rotary Drilling and Development Company to be organized and incorporated; that said defendants Stanley M. Halstead and P. E. Vaughan own and control said corporation defendant Rotary Drilling and Development Company and direct its business and affairs, and, without the license and consent and against the will of the plaintiff have [11] caused said Rotary Drilling and Development Company at divers times since its incorporation on or about March 20, 1919, to make, to sell

and to use within the State of California divers and sundry well mechanism embodying and containing the invention patented in and by said letters patent and particularly embraced and claimed in and by said claims 9, 13 and 20 thereof; that the defendant Allen W. Ross in furtherance of the said unlawful and infringing acts of the other defendants and of the conspiracy of said defendants Stanley M. Halstead and P. E. Vaughan, has acted and is acting as the general sales agent of the other defendants in the sale of said infringing well mechanism so manufactured and caused to be manufactured by them; that the said respective defendants are now continuing and threaten and intend to continue to manufacture, cause to be manufactured, sell and cause to be sold, and used and cause to be used the said patented invention, without the license or consent of plaintiff and within the State of California unless enjoined by this court, but to what extent or how many, exactly, of said infringing devices either or any of said defendants have made or used or sold or in what sum they have profited thereby is to the plaintiff unknown and plaintiff prays full discovery thereof from each of said defendants.

WHEREFORE plaintiff prays:

1. That the said defendants and each of them, their attorneys, officers, agents, servants, employees, associates, confederates and workmen and each and every thereof be enjoined and restrained during the pendency of this suit from manufacturing, using or selling or causing to be manufactured, used or sold, any well mechanism embodying or containing said patented invention and particularly any well

mechanism embraced within or covered by claims 9, 13 and 20 of said letters patent or any mechanism or parts thereof capable of or intended to be combined [12] in well mechanism in infringement of said letters patent, and that upon the final hearing of said cause said injunction be made permanent and perpetual.

2. That defendants and each of them be ordered, adjudged and decreed to pay over unto and that plaintiff recover from said defendants and each of them all the profits, gains or advantages realized by said defendants or either of them from said infringing acts, together with all damages sustained by plaintiff by reason of said infringing acts and that the Court increase the actual damages three times in view of the wilful character of such infringing and unlawful acts, and that the plaintiff have judgment against the defendants and each of them for the profits and damages so found and adjudged.

3. That plaintiff have judgment against defendants and each of them for its costs and disbursements herein and for such other further or different relief as to this Court may seem proper and be in accord with equity and good conscience.

LAYNE & BOWLER CORPORATION,

By MAHLON E. LAYNE,

President.

FREDERICK S. LYON,

LEONARD S. LYON,

WM. K. WHITE,

Solicitors for Plaintiff.

PAUL SYNNESTVEDT,

Of Counsel. [13]

State of California,  
County of Los Angeles.

Mahlon E. Layne, being first duly sworn, on oath says that he is the president of the Layne & Bowler Corporation, the plaintiff in the above-entitled suit; that he has read the foregoing bill of complaint and knows the contents thereof, and that the same is true of his own knowledge except as to such matters as are therein stated on information and belief and as to such matters he believes said bill of complaint to be true.

MAHLON E. LAYNE.

Subscribed and sworn to before me this 3d day of October, 1919.

[Seal] L. BELLE WEAVER,  
Notary Public in and for the State of California,  
County of Los Angeles.

[Endorsed]: Filed Oct. 6, 1919. Walter B. Mal-  
ing, Clerk. [14]

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In the Southern Division of the United States Dis-  
trict Court, for the Northern District of Cali-  
fornia, Second Division.

IN EQUITY—No. 485.

FOR INFRINGEMENT OF LETTERS PATENT  
No. 821,653.

LAYNE & BOWLER CORPORATION,  
Plaintiff,

vs.

WESTERN WELL WORKS, INC. (a Corpora-  
tion), ROTARY DRILLING & DEVELOP-

MENT COMPANY (a Corporation), STAN-  
LEY M. HALSTEAD, P. E. VAUGHAN,  
and ALLEN W. ROSS,

Defendants.

**Amended Answer.**

Come now the defendants above named, and for answer to plaintiff's bill of complaint, deny, admit and aver as follows:

**I.**

Answering paragraph I of the bill of complaint, defendants admit the allegations thereof.

**II.**

Defendants admit the allegations of paragraph II of the bill of complaint.

**III.**

Answering paragraph IV of the bill of complaint, defendants say that they have no information as to the truth of the allegations of said paragraph and therefore call upon plaintiff for full proof thereof.  
[15]

**V.**

Answering paragraph V of the bill of complaint, defendants admit that letters patent of the United States No. 821,653, dated May 29th, 1906, were granted to Mahlon E. Layne of Houston, Texas, for alleged improvements in well mechanism, but deny that said patent is valid, and deny that there was thereby granted and secured to said Mahlon E. Layne, his heirs, legal representatives and assigns, for the term of seventeen (17) years or for any term whatever, the exclusive or any right to make, use or vend the alleged invention throughout the

United States and territories thereof, or any territory or place whatever.

#### VI.

Defendants are not advised, save by the bill of complaint, as to the truth of the allegations in paragraph VI of said complaint, and therefore call upon plaintiff for full proof thereof.

#### VII.

Answering paragraph VII of the bill of complaint, defendants deny that the alleged invention of said letters patent went into great and extensive or any use, and deny that Mahlon E. Layne and his licensees have sold large numbers of well mechanisms embodying the alleged patented invention; further answering paragraph VII, defendants are not advised, save by the bill of complaint, as to whether or not Mahlon E. Layne or any of his licensees marked whatever well mechanisms were manufactured and sold by them with the word "patented," together with the day and year of said letters patent, and therefore call upon plaintiff for full proof thereof.

#### VIII.

Answering paragraph VIII of the bill of complaint, [16] defendants deny that Mahlon E. Layne and his licensees have expended large or any sums of money in carrying out their alleged business of manufacturing and selling well mechanism embodying said alleged invention, and deny that the public has acquiesced in the alleged exclusive right of plaintiff with respect thereto, and deny the other allegations of said paragraph and call for strict proof thereof.

IX.

Answering paragraphs IX, X, XI and XII of the bill of complaint, defendants deny that the validity of said letters patent has been upheld by the Circuit Courts of Appeal referred to in said paragraphs, except to a very limited extent; and further answering said paragraphs, defendants allege that such courts have so restricted the scope of said letters patent that they do not cover or include any well mechanism manufactured, used or sold by these defendants.

X.

Answering paragraph XIII of the bill of complaint, defendants deny that they have jointly or severally, or otherwise, or at all, made, or used, or sold, or caused to be made, or used or sold, any well mechanism embodying the alleged invention described in said letters patent, and particularly in claims 9, 13 and 20 thereof, or of any of them, but allege that each and all of the well mechanisms manufactured by defendant, Western Well Works, at all the times complained of herein were manufactured in accordance with, and under the protection of, United States letters patent issued to Stanley M. Halstead, No. 1,228,770, dated June 5th, 1917, and deny that any of said well mechanisms were or are an infringement of said letters patent issued to Mahlon E. Layne; further answering paragraph XIII, defendants deny that the defendant, [17] Rotary Drilling & Development Company, either conspiring with said defendants, Western Well Works, Inc., Stanley M. Halstead, P. E. Vaughan and Allen W. Ross. or otherwise, or at all, has made,



sold or used, or caused to be made, sold or used, well mechanism embodying the alleged invention of said letters patent to Mahlon E. Layne, and allege that said defendant, Rotary Drilling & Development Company, is not engaged in the manufacture of well mechanism or other machinery whatsoever; further answering paragraph XIII, defendants deny that plaintiff has suffered great or any damage or injury by reason of any acts on the part of these defendants, and deny that these defendants have realized great or any profits from *an* wrongful or infringing acts complained of in said bill of complaint.

### XI.

Answering paragraph XIV of said bill of complaint, defendants Stanley M. Halstead and P. E. Vaughan, admit that they are interested in and direct the business of the Western Well Works, Inc., but deny that they, or either of them, have directed any acts in infringement of the letters patent to Mahlon E. Layne; further answering paragraph XIV defendants, Stanley M. Halstead and P. E. Vaughan, admit that they entered into a certain contract or written agreement with plaintiff on or about October 1st, 1914, but deny that said contract is of binding force and effect on any of these defendants, and further allege that said contract and all the terms thereof was, by mutual consent, cancelled and set aside on the 24th day of March, 1915, prior to the incorporation of the defendant, Western Well Works, Inc., and prior to the date of the alleged acts complained of herein. That by said contract of cancellation of March 24th, 1915, and a subsequent instrument in writing between the defendant,

Western Well Works, Inc., and the Layne & Bowler Corporation, plaintiff herein, dated September 19, 1916, each party thereto and defendants, Stanley M. Halstead [18] and P. E. Vaughan mutually released each other from all obligations whatsoever under the aforesaid contract of October 1, 1914, all of which facts are well known to plaintiff herein; further answering paragraph XIV, defendants deny that said defendants, Stanley M. Halstead and P. E. Vaughan caused the defendant, Western Well Works, Inc., to be incorporated for the purpose of manufacturing devices in infringement of said letters patent to Mahlon E. Layne, and deny that said defendants, Stanley M. Halstead and P. E. Vaughan, caused the defendant, Rotary Drilling & Development Company, to be incorporated so that said defendant, Rotary Drilling & Development Company, is owned and controlled, and the business thereof directed, by said defendants, Stanley M. Halstead and P. E. Vaughan; further answering said paragraph XIV, defendants deny that defendant, Allen W. Ross, conspiring with the other defendants herein, or otherwise, or at all, has sold well mechanism infringing said letters patent to Mahlon E. Layne, and deny that said defendants are now manufacturing, using or selling, or causing to be manufactured, used or sold, or threaten to continue to make, use or sell, or cause to be made, used or sold, any well mechanism in infringement of said letters patent to Mahlon E. Layne.

## XII.

Without waiving any of the matters and things above set forth, but repeating and insisting upon

the same, defendants further answering, and for a further and particular defense, say that said letters patent issued to Mahlon E. Layne, and particularly claims 9, 13 and 20 thereof, are invalid, and aver that prior to the alleged invention thereof by said Mahlon E. Layne, the same thing, or substantially the same thing, was shown and described in the following letters patent of the United States: [19]

No. 425,933, dated April 15, 1890, granted to C. W. Crammell, for Compound Pump;

No. 522,518, dated July 3, 1894, granted to S. N. Eisler, for Rotary Pump;

No. 682,939, dated Sept. 17, 1901, granted to E. M. Ivens, for Centrifugal Pump Mechanism for Deep Wells;

No. 705,844, dated July 29, 1902, granted to E. M. Ivens, Dec'd, for Pump Mechanism;

No. 735,691, dated Aug. 11, 1903, granted to J. W. Alvord, for High Speed Rotary Pump, filed Dec. 24, 1902;

No. 735,692, dated Aug. 11, 1903, granted to J. W. Alvord, for High Speed Rotary Pump, filed Mar. 30, 1903;

and the following British patents:

No. 12,886 of 1835 to Vojacek;

No. 2,774 of 1860 to Thompson;

No. 24,430 of 1894 to Mather;

and German patent #80,806; and other letters patent of the United States and foreign countries, the numbers and dates of which are at present unknown to these defendants, but which defendants pray leave to insert by amendment to this answer when discovered.

XIII.

Defendants further allege that said letters patent to Mahlon E. Layne, and particularly claims 9, 13 and 20 thereof, are invalid, and aver that prior to the alleged invention thereof, by said Mahlon E. Layne, the same or substantially the same thing was known and used by others in the United States, as follows, to wit:

Edgar N. J. Thompson of Los Angeles at San Francisco, California.

H. C. Robb of Los Angeles, at San Francisco, California and Milwaukee, Wisconsin. [20]

Wm. Cramp & Sons Ship & Engine Bldg. Co., of Philadelphia, Pa., at Philadelphia, Pa., and Niagara Falls, and elsewhere.

Frank H. Jackson, of Los Angeles, Cal., at Berkeley, Calif., and elsewhere.

American Well Works of Illinois, at Aurora, Ill., and Chicago, Ill.

J. W. Alvord, of Chicago, Illinois, at Chicago, Ill.

W. B. Gregory, of New Orleans, La., at New Orleans, La.

John Y. Snyder, of Shreveport, La., at New Orleans, La.

Harry A. Prindle, of East Orange, N. J., at Brooklyn, New York.

Swift & Company, of Chicago, Ill., a corporation of Illinois, at Chicago, Ill.

Pabst Brewery, of Milwaukee, Wisconsin;

Byron Jackson Iron Works, San Francisco, California, and Berkeley, Calif.

E. Barnes of Mt. Pleasant, Mich., at Mount Pleasant, Mich.

- S. W. Martin, of Springfield, Ohio, at Springfield, Ohio.
- C. W. Crannell, of Oberlin, Kansas, at Oberlin, Kansas.
- J. W. Downie, of Beaver Falls, Pa., at Beaver Falls, Pa.
- S. N. Eisler, of New Orleans, La., at New Orleans, La.
- C. Rodenbaugh, of Allegheny, Pa., at Allegheny, Pa.
- R. J. Northam, of Los Angeles, Cal., at Los Angeles, Cal.
- E. M. Ivens, of New Orleans, La., at New Orleans, La.
- G. A. Farwell, of Manchester, N. H., at Manchester, N. H.
- W. B. Sulver, of Carbondale, Pa., at Carbondale, Pa.
- A. N. Ellis, of San Bernardino, Cal., at San Bernardino, Cal.
- D. B. Mead, of Madison, Wisconsin, at Milwaukee, Wisconsin, and elsewhere.
- Wm. Clasman, of Milwaukee, Wis., at Milwaukee, Wisconsin, and elsewhere.
- W. L. Forward of San Francisco, Cal., at San Francisco, Cal., and elsewhere. [21]
- J. B. Keating, of San Francisco, Cal., at San Francisco, Cal., and elsewhere.
- Byron Jackson, of San Francisco, Cal., at San Francisco, Cal., and elsewhere.
- C. H. Thomas, of Berkeley, Cal., at San Francisco, Cal., and elsewhere.
- and was also known and used by others and at places

at this time unknown to these defendants, but which names and places defendants pray leave to insert by amendment when discovered.

XIV.

Defendants further allege that said letters patent to Mahlon E. Layne, and particularly claims 9, 13 and 20 thereof, are invalid, and aver that more than two years prior to the application of said Mahlon E. Layne for said letters patent, said supposed invention was in public use or on sale in this country as follows, to wit:

By American Well Works, of Illinois, at Aurora, Ill., and Chicago, Ill.

R. D. Wood & Company of Philadelphia, Pa., used at Philadelphia, Pa., at Brooklyn, New York, and elsewhere in the United States.

Harry A. Prindle of East Orange, New Jersey, used at Brooklyn, New York.

Prindle Engineering Company and Camden Iron Works, at Camden, New Jersey, used at Camden, New Jersey, and at Brooklyn, New York.

Mast, Foos & Company, of Springfield, Ohio, used at Springfield, Ohio, and in various other places in the United States unknown at present to this defendant.

Byron Jackson Iron Works, at San Francisco and Berkeley, California, and elsewhere.

Wm. Cramp & Sons Ship & Engine Bldg. Co. of Philadelphia, Pa., at Philadelphia, Pa., Niagara Falls and elsewhere.

J. W. Alvord, of Chicago, Ill., at Chicago, Ill., and elsewhere.

and by others and at other places at present unknown to these defendants, but which names and places defendants pray leave to [22] insert by amendment when discovered.

### XV.

Defendants further allege that said Mahlon E. Layne was not the original, first and sole, nor any inventor of the subject matter of said letters patent, and particularly claims 9, 13 and 20 thereof, but that the subject matter of said letters patent was invented by the following named persons prior to the alleged invention of said Mahlon E. Layne:

Frank H. Jackson, of Berkeley, California.

J. W. Alvord, of Chicago, Illinois.

S. N. Eisler, of New Orleans, La.

A. N. Ellis, of San Bernardino, Cal.

E. M. Ivens, of New Orleans, La.

C. W. Crannell, of Oberlin, Kansas.

Harry A. Prindle, of East Orange, New Jersey.

D. B. Mead, of Madison, Wisconsin.

Byron Jackson, of San Francisco, California.

### XVI.

For a further and separate defense, defendants allege that plaintiff is not entitled to equitable nor any relief in this court by reason of plaintiff's laches in that plaintiff for more than four years last past has had full knowledge of the acts of defendants and the business conducted by them and during all this time has permitted defendants to continue in said business and build up same without asserting its alleged rights; that the present suit is not brought in good faith but that plaintiff was forced to bring same in an attempt to bolster up its

defense in a suit now pending in the Superior Court of the state of California, in and for the County of Santa Clara, wherein the Western Well Works, Inc., the defendant herein, is plaintiff, and plaintiff herein is defendant; that the basis of said suit is the inequitable [23] oppressive and unlawful conduct of plaintiff herein in attempting to injure and destroy defendant, Western Well Works, Inc., lawful business in the manufacture and sale of well mechanism patented under said letters patent to Stanley M. Halstead by threatening the trade with unlawful and groundless suits for infringement which plaintiff has failed for more than four years to bring; and that said inequitable conduct on the part of plaintiff is a bar to its securing any equitable or other relief in this court.

WHEREFORE, and for the cause aforesaid, these defendants deny the equity of plaintiff's bill herein and all manner of wrongful and unlawful acts wherewith in the said bill of complaint these defendants are charged, and further denying the right of plaintiff to the relief or any part thereof sought against these defendants in said bill of complaint, all of which matters and things these defendants are ready and willing to aver, maintain and prove as this Honorable Court shall direct and humbly pray to be hence dismissed with their reasonable costs on this behalf.

CHAS. E. TOWNSEND,

CHAS. M. FRYER,

Attorneys for Defendants.



Dated December —, 1919.

Receipt of copy of the within amended answer admitted this 3d day of February, A. D. 1920, reserving all objections and objection — defendants and each of them, are estopped from attacking validity of patent sued on.

F. S. LYON and  
WM. K. WHITE,  
For Plaintiff.

[Endorsed]: Filed Feby. 9, 1920. Walter B. Maling, Clerk. [24]

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(Title of Court and Cause.)

**Injunction Pendente Lite.**

The above causing coming on to be heard before the Hon. William C. Van Fleet, on this 19th day of January, 1920, on the motion of the defendants for an injunction *pendente lite*, the plaintiff appearing by its counsel, Wm. K. White, Esq., and the defendants, by Wm. A. Loftus, Esq., and the Court being fully advised in the premises,—

**IT IS HEREBY ORDERED:** That pending the final decision of this case the plaintiff, its officers, directors, attorneys, clerks, agents and employees be, and they hereby are severally enjoined and restrained from in any way issuing or publishing statements like those contained in the advertisement attached to defendants' motion papers, or publishing statements in any form whatsoever, either written or oral, claiming that the defendants are insolvent or about to become insolvent, or are attempting to conceal their assets, and from sending

out circulars or letters or making any representations, either oral or otherwise, to defendants' agents, customers or representatives, or prospective customers or prospects of this defendant, threatening such person or persons with litigation or prosecution, or with the costs and expenses of litigation; and from advertising or publishing that suits are about to be brought against defendants' customers, or otherwise publishing statements, either written or oral, bearing on the merits of the pending litigation, beyond what is actually necessary to inform the public that a suit is pending and the character of such suit.

WM. C. VAN FLEET,  
Judge.

Dated January 19th, 1920.

[Endorsed]: Filed Jan. 19, 1920. W. B. Maling,  
Clerk. By J. A. Schaertzer, Deputy Clerk. [25]

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In the Southern Division of the United States District Court, for the Northern District of California, Second Division.

IN EQUITY—No. 485.

LAYNE & BOWLER CORPORATION (a Corporation),

Plaintiff,

vs.

WESTERN WELL WORKS, INC. (a Corporation), et al.,

Defendants.

**Depositions.**

Depositions *de bone esse* taken on behalf of de-

fendants in the above-entitled suit pursuant to the attached notice, before Arnold R. Petersen, a notary public in and for Dane County, Wisconsin, at the office of Burr W. Jones, Esq., in the Badger Block in the city of Madison, county of Dane, State of Wisconsin, taken at the said office in lieu of the place named in the notice, by consent and for convenience of counsel, commencing at the hour of ten A. M., on Monday, February 9th, 1920.

Present: FREDERICK S. LYON, Esq., on Behalf  
of the Plaintiff.

WILLIAM A. LOFTUS, Esq., on Behalf  
of Defendants.

The following testimony was taken and proceedings had, to wit:

Mr. LYON.—The taking of these depositions is proceeded with subject to the objection by plaintiff that defendants are estopped from contesting the validity of the patent in suit and are estopped by contract as to the scope of the claims of the patent in suit, and the depositions are taken to be read at the trial, at which time such objections will be urged.  
[26]

Mr. LOFTUS.—In view of the fact that the testimony about to be taken at this time on behalf of these defendants is to be the same testimony to be used by the defendants in the case of this same plaintiff against the American Well & Prospecting Company et al., being suit in equity No. E.—42 pending in the United States District Court for the Southern District of California, and inasmuch as counsel for the said American Well & Prospecting Company et al. is present and has already given

notice of his intention to examine these same witnesses upon the same matters touching the present case, and in order to prevent duplication of the examination of these witnesses in the two causes and for the purpose of saving time and expense of all parties concerned, I will state, on behalf of the Western Well Works, Inc., and the other defendants in this case, that I shall waive the examination of these witnesses in favor of Mr. Blakeslee, attorney for the defendants in the American Well & Prospecting Company et al. case, and will accept and adopt his examination and the testimony adduced thereby by him as the testimony and record in this case, reserving, of course, the right to interpolate interrogatories or objections as may appear necessary or proper.

Mr. LYON.—The statement of counsel for the defendants has been listened to and observed. The plaintiff has no objection to adopting the direct examination or redirect examination of the witnesses produced, but insists that if such procedure is adopted only one counsel shall interrogate the witness and that the complete direct examination shall be finished before the witness is cross-examined and likewise any redirect examination shall be completed before any recross. [27]

**Deposition of Daniel W. Mead, for Defendants.**

DANIEL W. MEAD, a witness produced and sworn on behalf of defendants, testified as follows in answers to questions put by Mr. Blakeslee:

Q. Please state your full name, age, residence and profession, Mr. Mead.

(Deposition of Daniel W. Mead.)

A. Daniel W. Mead; residence, Madison, Wisconsin; age, 58, in March. My profession is civil engineer; also Professor of Hydraulic and Sanitary Engineering at the University of Wisconsin.

Q. Kindly state what academic training and study or course of studies were pursued by you preparatory to your professional career and your career as professor.

A. Well, I spent a couple of years learning the machine trade before entering college. I entered Cornell University, New York, in 1881 and graduated in the civil engineering department in 1884. My first work was with the United States Geological Survey, Glacial Division, under Professor T. C. Chamberlain, and consisting of topographical work in the Chippewa Valley in the fall of 1884.

In 1885 I was appointed city engineer of Rockford, Illinois, which was my home town at that time, and was city engineer of Rockford for two or three years. I organized in Rockford what was known as the Rockford Construction Company, resigning as city engineer, and began contracting about 1888. I was engineer and general manager of the Rockford Construction Company for about eight years. That company did municipal public work, largely in the way of building foundations, sewers, water-works, pavement, road improvement and matters of that sort. They went out of business about 1886. About 1886 I [28] entered into a contract with the city of Rockford to develop a water supply for the city.

Q. 1886? A. 1896.

(Deposition of Daniel W. Mead.)

Q. You said they went out of business in 1886.

A. If I did I made a mistake. You will have to bear with me a little bit. I was home sick all last week and my head isn't just as clear as it ought to be this morning. Our Rockford Construction Company went out of business about 1896, and in 1896 I entered into a contract with the city of Rockford to develop a water supply. In that connection I went west to San Francisco to interview various manufacturers of centrifugal pumping machinery. Among those I met and discussed the question of centrifugal pumps with for the Rockford works was the Tracy Engineering Company, and the Byron Jackson Machine Works—I think that was the title—but in any event Mr. Byron Jackson of San Francisco was the man that I saw. I also saw several other parties in San Francisco who were interested in the manufacture of centrifugal pumps. One was named Krogh, I think. There were a number of others. I think there was a San Francisco Tool Works; I am not quite confident as to the latter. There was one other company whose name slips me.

From San Francisco I visited with the representative of the Byron Jackson Company a number of pumping plants along the Sacramento Valley. These were all drainage centrifugal plants, but my visit there was to see the character of work done by the Byron Jackson Machine Works. I also went down at that time to San Jose and visited some of the orchards around San Jose, where the Byron Jackson Machine Works had established irrigation

(Deposition of Daniel W. Mead.)

pumping plants, where they pumped from deep open [29] wells to the surface, eighty feet or more, by pumps situated at the base of these wells or shafts; said pumps being operated by engines located at the surface and driving the shafts by quarter turned belts at the surface, the shaft being connected with the pumps located below.

I then returned to Rockford by way of Los Angeles and the Southern Pacific, and afterwards entered into a contract with the Byron Jackson Machine Works for furnishing the three pumps, three pumping units, for Rockford, Illinois. The work at Rockford was carried on during 1897 and 1898 and according to the best of my recollection was finished up either late in 1898 or early in 1899.

In 1899 I moved to Chicago and established an office in the First National Bank Building of that city as Consulting Engineer. My business was largely in the way of preparing plans and specifications for municipal water supplies, and in this connection I built and rebuilt some 75 or a hundred different waterworks throughout Indiana, Illinois, Wisconsin, Iowa, Minnesota, Texas and possibly some minor work in other states.

At the request of the city of Ft. Worth, Texas, I made a report on securing an artesian supply from the Trinity sands and Pleuxey sands that underlie the city of Ft. Worth. This request was on account of the successful completion of the supply at Rockford, Illinois, previously mentioned. After the report was made the city induced me to enter into a contract to construct this system and furnish this

(Deposition of Daniel W. Mead.)

supply and my recollection is that that contract was carried out somewhere between 1900 and 1903 or '04—I presume the date is not particular. [30]

In this connection I also bought certain pumps of the Byron Jackson Machine Works, these pumps being built to locate in an open shaft, operated by engines and rope drives connecting the pumps with the engines at the surface. In that case the engines were down about 154 feet. I think I made a mistake there. I said the engines were down—the pumps were down about 154 feet. In the case at Rockford the pumps were down about 85 feet below the surface. In both cases the pumps were operated by rope drives from the fly-wheels of engines that overhung the shaft, the pumps being located below and the engines being at the surface.

Along about this same time I acted as engineer for A. E. Rutledge & Company and bought similar pumps for the city of Elgin, Illinois. In that case A. E. Rutledge simply installed the pumping plant; Byron Jackson furnished the pumps. As engineer for the Danville Water Company at Danville, Illinois, I designed and installed a pumping and filter system in that city. This was also in the early '90's. In that connection I purchased two low-lift centrifugal pumps from the Byron Jackson Machine Works for the Danville Water Company, which pump raised the water from the river into the settling basins.

As engineer of the company that had a franchise



(Deposition of Daniel W. Mead.)

at New Albany, Indiana, the name of the company I have forgotten, but as engineer of the company I bought two pumping units of the Byron Jackson Machine Works. My recollection is that in that case there were either three or four pumps in series in each unit. They were to be driven by a two-hundred horse-power motor to take water from wells and raise it about 200 feet into a reservoir on top of a hill. The company had some financial difficulty and the work was abandoned. I don't know what became of the pumps, although I do understand that they were [31] afterwards installed by another company.

In connection with the building of numerous small waterworks in the Upper Mississippi Valley I had occasion to develop a great many deep wells. The first one of that sort that I developed was in 1893 for the city of DeKalb, Illinois. I might say in this connection and as generally explanatory of our conditions through the Upper Mississippi Valley, that the whole Upper Mississippi Valley in southern Wisconsin, southeastern Minnesota, eastern Iowa and northern Illinois, are underlaid by great sandstone deposits, the lower of which are known as the Potsdam deposits. The Potsdam deposits consist of alternate layers of sandstone, together with shales and limestones interbedded; above this lies what is known as the lower magnesium limestone, a rather closegrained limestone, which in turn is covered by the St. Peter sandstone, another extensive sandstone deposit. These

(Deposition of Daniel W. Mead.)

sandstones outcrop in Wisconsin; the Potsdam deposit having an outcrop of something like 14,000 square miles, and the St. Peter an outcrop of nearly two thousand square miles. The rains in Wisconsin falling on these outcrops or soaking through the overlying soil, saturate these sandstones and follow them in their dip, which in a general way is away from the granite nucleus in northern Wisconsin. In other words, it dips south towards Illinois, southeast towards the southern part of Michigan, southwest towards Minnesota and Iowa. In these other states these sandstone deposits are reached by deep well drilling, and in almost every case one or both of these deposits can be encountered by the drill, and are found at varying distances from, say, in general, a hundred feet, the deepest well that I know of is about three thousand feet in [32] depth; where these sandstones are pierced by the drill the water rises toward the surface. In many cases it overflows to a small extent. But where large quantities have to be obtained, the water has to be pumped to a considerable distance below the surface in order to furnish sufficient head to develop the quantity of water needed for these small water supplies. Now, in order, then, to develop the small water supplies for numerous small cities and towns in the states I have mentioned, we have drilled wells into one or more of these layers of sandstone and in most cases have been obliged to attach pumps in various forms in order to secure the necessary quantity of water.

(Deposition of Daniel W. Mead.)

In 1893 at DeKalb, before mentioned, a well was drilled, as I now rememehr it, about 14 inches in diameter, down for about 200 feet, and smaller below, to a depth of perhaps a thousand feet or more. Then in this well was placed a reciprocating pump. My recollection is that the barrel of the pump was located down a hundred feet or more below the surface and raised the water from the sandstone, rising to this height where the pump cylinder was placed, raised from that into a reservoir, and then pumped from the reservoir to the city system.

Now, these reciprocating pumps were rather unsatisfactory. There were a variety of them in use. For example, in the place before mentioned of DeKalb they had previously drawn water from a similar well located up on the hill and have used what we call a double-acting steam-driven deep well pump. This consisted of a 36-inch steam cylinder located at the surface and the water cylinder located a hundred to a hundred and fifty feet below the surface. The steam consumption was exceedingly extravagant. If I remember it, it [33] cost about 13 cents a thousand gallons to pump the water with the old pump, and in the case of my installation it was in an endeavor to get more water at a less price. We installed what was termed a double-acting power head, built by the Downey Pump Company, which had two pistons in the cylinder located below the surface, one connected with a pipe, the other connecting with a rod operated

(Deposition of Daniel W. Mead.)

through the pipe, so that when one was going up the other was going down, and the pump was double-acting. We were able by using electrical drives on this pump to decrease the cost to about two and a half cents a thousand gallons. But in both cases we had a good deal of trouble on account of the shock of starting and stopping the column of water at the dead centers when these reciprocating pumps were turning over, and it got to be a very serious proposition where large quantities had to be taken from the wells.

Q. Let me interrupt right there, Professor. Please state what caused the actual lift in these pumps you have last spoken of. That is, what was the part that lifted the water operated by the concentric rods?

Mr. LYON.—We object on the ground that this is all irrelevant and immaterial and simply unnecessarily prolonging the examination of this witness, has no bearing upon the issues of this case.

Mr. BLAKESLEE.—The relevancy will appear.

A. The action of the pumps of course was to raise the water from this lower elevation, and in order to do so every time the piston came up in the cylinder it had to raise a column of water equal to the diameter of the piston and of a length from the point below the surface at which the piston operated to the height at which the water overflowed into the reservoir. That meant a column of water six inches or more in diameter [34] and a hundred feet or more in length which had to stop

(Deposition of Daniel W. Mead.)

and start every time the pump reciprocated or made a stroke; and on account of the excessive weight of the water, due to its size and length, this threw excessive shocks into the connecting mechanism, the rod and pipes that connected these pistons with the operating mechanism at the surface.

In order to overcome this, various types of pumps were invented, one of which was invented by E. E. Johnson, then of the Henion & Hubbell Company of Chicago. That pump consisted of the adaption of the Whitworth quick return, that is used on the shaper in the machine-shop, by an eccentric connection. The shaper makes a very slow advance and a very quick return, and Johnson adapted that to a double-acting pump, by means of which the cylinder which was unloaded would go down into the well rapidly and come up slowly. The consequence was that there were two of these pistons in the cylinder, that there was one coming up all of the time, and the shock on the rod was thus largely eliminated. The idea was apparently a very good one, but it was not mechanically well constructed. I had occasion to see, and in one case to test one of these pumps, and they were not satisfactory. In fact I think at the present time they are probably out of existence entirely, although if properly worked up I still believe that there is a field for a pump of that sort. Now, about that time—I am not exact in regard to dates—(Witness refers to memoranda).

Mr. LYON.—We object to the witness referring

(Deposition of Daniel W. Mead.)

to memoranda at the present time for the purpose of refreshing his recollection as to dates, or for any other purpose in answering this question.

Mr. BLAKESLEE.—Let it be shown that the witness refers to some memoranda in respect to this particular date. [35]

Mr. MEAD.—Well, I am obliged to refresh my memory in regard to the date of a paper that was prepared by Nicholas Simin, who was a civil engineer, an engineer of the water works of Moscow, Russia. He came to this country in 1901—

Mr. LYON.—The further objection is urged that the contents of any such paper are incompetent, and inadmissible in this case, not pleaded, and it is apparent that the witness is referring to some typewritten memoranda which has been produced before the witness took the stand in this case, and we further object to the detailing by the witness of all these matters which are not pleaded and are irrelevant, immaterial and incompetent and inadmissible under the pleadings.

Mr. BLAKESLEE.—The witness in these respects is obviously tracing the prior art, and in these respects the pleadings need not make issue.

Mr. LYON.—We call the Court's attention and the attention of counsel to the equity rule forbidding argument on the record and will ask, if the record of these depositions is to be lumbered with argument and statements by counsel for the defendant, that a suitable portion of the cost of the taking of these depositions and of these proceedings be charged against the defendant on account of the

(Deposition of Daniel W. Mead.)

violation of the equity rule in that regard. And this notice will be understood as continued through the taking of these depositions without being hereafter repeated.

Mr. BLAKESLEE.—We wish the equity rule mentioned to be observed and call the attention of the Court that counsel for plaintiff has several times interrupted the witness, and we have no desire to argue the matter here and only make such statements on the record as appear to be germane to the statements [36] of counsel. We believe counsel should make his objections to answers, and motions if he deems necessary after answers, and the witness should not be interrupted.

A. Mr. Simin read a paper on the water supply of Moscow, that may be seen in the Proceedings of the American Waterworks Association, 1901, pages 33 to 41. In this paper Mr. Simin described certain centrifugal pumps which had been installed by a manufacturing concern, Farcoe, I think it is, of Paris, France, installed by this company in the Moscow waterworks for raising water from deep wells to the surface; which consisted, as I recall it, of a single centrifugal pump, driven at a high rate of speed, which was sufficient to pump the water for some considerable distance from below the surface to the surface.

On account of the problem which was continually before my office at this time of securing quantities of water from wells of this nature, and the difficulty previously mentioned due to reciprocating machinery and its constant wear and breakage, the method

(Deposition of Daniel W. Mead.)

used in Moscow appealed to me as of considerable interest. In that connection I wrote to the Byron Jackson Machine Works, or to Mr. Byron Jackson, who had manufactured pumps for me before, and inquired as to whether he would undertake to manufacture a pump of generally the same character as—

Mr. LYON.—We object to the witness detailing the alleged contents of a letter, on the ground that the same is incompetent, not the best evidence, no foundation laid for the introduction of secondary evidence.

A. (Continuing.) —as those they used in the Moscow waterworks. We had considerable correspondence about this matter, of a [37] general nature, and not applied to any particular place. My recollection is that our first correspondence began early in 1902, although it might have been late in 1901. I afterwards, in 1902, in the latter part of May and early in June, visited San Francisco, primarily in connection with certain pumps that the Byron Jackson Company were making for me for Ft. Worth, Texas, and at that time discussed with Mr. Jackson in considerable detail the need of deep well centrifugal pumps, and my own desire to utilize them in some of my work in the Upper Mississippi Valley. Mr. Jackson had previously to this sent me certain sketches and written various letters in regard to this matter.

Q. Now, at that point, allow me to interrupt, Mr. Witness. I think possibly a further question should be asked. What sort of a well was it cus-



(Deposition of Daniel W. Mead.)

tomary to use in connection with the early pumps you have spoken of for installing the pump barrel below the surface?

A. It depended somewhat on the local conditions, but in general we have in the Upper Mississippi Valley a certain drift sheet that varies from only a few feet in depth, sometimes to two or three hundred feet in depth. This drift sheet consists of broken fragmentary materials like clays, sands and gravels, etc., and overlies the indurated rocks. It is necessary to put what we term a drive-pipe of large dimension, larger dimensions than the well, down through this upper material and into the rock to prevent caving, and then the well below this point is usually drills of a smaller size and may or may not be lined to some distance below the rock with pipe. The drive-pipe, where the well is not otherwise lined, has to be well anchored into the rock and has to be large enough to contain the pump [38] cylinders or other type of pumping machinery which are to be placed in the wells, and the type of machinery to be placed in the wells may very materially modify the well that is to be drilled and its construction.

Q. And what diameters were customarily employed in these wells in which the machinery was installed down in the well—the diameters of the wells.

A. In the early days the quantities were small and the wells were mostly 8 and 10 and 12 inch. The well which I installed at DeKalb in 1893 was 14-inch diameter, was rather an unusually large

(Deposition of Daniel W. Mead.)

one, but was necessary in order to secure the largest quantity of water which we needed. And it was necessary, too, in the reciprocating pumps to have wells of rather excessive size in proportion to the quantity of water to be obtained from them, on account of the interrupted flow of water due to the reciprocation of the pumps. In other words, the pumps did not furnish a continuous flow, and one of the advantages to be gained by any rotating pump, such as a centrifugal pump or other pump of that sort, if used in the well, was the fact that the discharge was continuous and the size could somewhat be reduced on that account. But the main point or advantage in all pumps of that type is the fact that there is no reciprocation, no shocks, and that the play is in one direction and the strain is constant and no shocks or reciprocation, although there is a discharge of high rotary speeding which has to be considered.

Q. What is the latter type of pump you are speaking of now?

A. Well, all rotary pumps. I should include centrifugal pumps and pumps of the impeller type, and even pumps of the rotary piston type. [39]

Q. How long in your practice have pumps of that type been employed in wells?

A. The first one that was employed in the United States so far as I know was one which Jackson built for me in connection with the same correspondence, but for the Pabst Brewing Company in Milwaukee. That was, I think, installed in 1903.

Q. Do you remember how many stages that pump

(Deposition of Daniel W. Mead.)

had or what its general organization was?

A. Why, no, I don't remember exactly the number of stages. It was four or five, that is my recollection, and consisted of simply four or five pumps located right over each other, with a single shaft driven through them, and the lower one discharging into the second, the second into the third, the third into the fourth, and the fourth into the fifth. Whether there were four or six I don't know, but there were several, because Jackson told me that he estimated each one of those pumps would raise water about fifty feet, that he had to have a pump for each 50 foot raise, and that he usually provided something above that, and my recollection is that in that particular installation we were prepared to raise the water 200 feet, which would mean four pumps that would each raise 50 feet. But my recollection was there was one or two extra pumps in order to be sure to get the required head and raise the water for the full 200 feet.

Q. What is the practice in your knowledge to-day in wells, in using rotary pumps, as to one or more stages or units in superimposed relation?

A. Well, most all of the centrifugal pump manufacturers are manufacturing pumps of that general character to-day, consisting of several units, one discharging into the other, and the last one discharging into a pipe reaching to the surface. [40]

Q. What is the reason for using a number of these units or propellers, one over the other, instead of using one large or single propeller or unit?

A. It is in order to raise the water to a full

(Deposition of Daniel W. Mead.)

height from a well of small diameter.

Q. And what kind of a well, what is that well known as in its type?

A. They are usually termed in this part of the country bored wells. They are drilled from the surface by the use of certain types of churned tools, and, as I said before, using a casing down to the rock, and sometimes away down below the rock, where caving rock is found.

Q. Did they used to use wells of a larger diameter than they do now?

A. Well, no and yes, both. These drilled wells have increased in diameter of late years on account of the larger quantities of water that are needed, and they are larger to-day than they were at the time I am speaking of. On the other hand, in the earlier days they were obliged, wherever water had to be raised, to dig open wells. Those open wells were constructed very frequently at considerable expense. For instance, in the Rockford proposition that I put in in 1896 we had a shaft 15 feet in diameter and 85 feet deep. Then we went down with a six-foot shaft about twenty feet more, then tunneled out to various wells and connected piping with them and brought that piping into the central shaft and connected it up with the suction of one of these large pumps. This large shaft was needed, because the pumps were installed down in the shaft and they had to be accessible from the surface. The expense, of [41] course, of that kind of an installation was very high. The Rockford shaft and pumping installation together cost them about

(Deposition of Daniel W. Mead.)

\$60,000, giving a capacity at that time of about seven million gallons.

Q. For what unit of time?

A. Seven million gallons per day. At Waterloo, Iowa, where I afterwards installed some deep well centrifugal pumps, one engineer had advised a shaft and tunnel system. I was representing in that case the N. W. Harris company of Chicago, who owned the Waterloo works, and I calculated that the cost of installing the shaft and tunnel system at Waterloo, similar to that installed at Rockford and Ft. Worth, would be about \$150,000, and that the deep well centrifugal pump could be installed of the same capacity for about \$50,000.

Q. Do you know who furnished the pump apparatus for the Waterloo installation you have spoken of?

A. Yes. That was furnished by the Byron Jackson Machine works.

Q. And when was that installation put in?

A. About 1904, as I recall it.

Q. Now returning a moment to the previous line of inquiry. Please state briefly as you may wish what matters you are engaged upon to-day, in a general way.

A. My work at the present time is largely—well, entirely in general consulting practice. That is, I pass on a great many propositions that are designed and installed by other engineers, for various bond houses in St. Louis, Milwaukee, Chicago, Pittsburg, New York and Boston, where bonds are to be taken on engineering work. Then we design and build

(Deposition of Daniel W. Mead.)

plants, mostly in the way of waterworks and hydro-electric plants. I might say that in the last few years I have designed and [42] built one plant over at Prairie du Sac, about 28 miles from Madison, for the Wisconsin River Power Company, involving a cost of about three million dollars. Just previous to that I built another plant for the Southern Wisconsin Power Company at Kilbourn, involving about two million and a half dollars. I have built plants at High Falls. These are hydro-electric plants, all of them, with high tension transmission system. The plant at High Falls involved about a million and a quarter; transmitted power from High Falls on the Peshtigo River to Green Bay, a distance of about sixty-odd miles. I have installed for the Peninsular Power company, whose headquarters are here at Madison, a plant at Iron Mountain on the Menomonee River, costing as I recall it, about a million dollars, and I have just finished the second plant for the same company on the Brule River, involving about three-quarters of a million dollars. These two plants furnish energy at about 66,000 volts to the iron region around Menomonee, what is known as the Menomonee range, to Iron Mountain and Iron River, Michigan, and some of the adjacent Wisconsin territory. I have just within a year completed rebuilding the waterworks here at Madison at an expense of about \$400,000. I am now engaged in the designing and reconstruction of the Rockford, Illinois, waterworks which will cost from half to three quarters of a million. I might say that I am acting as consulting engineer on sev-

(Deposition of Daniel W. Mead.)

eral drainage propositions in Arkansas and southern Missouri. For example, I am consulting engineer of the Little River drainage district, involving a drainage of about 550,000 acres. I represented the bankers there in the first place and am now representing the district on some of their more difficult work. Also just passed on the Poinsett drainage district of Arkansas, a matter involving about four million dollars. I might say that I am also at present acting as one of the [43] board of appraisal of the waterworks at Clinton, Iowa, and have acted on appraisal boards in perhaps fifteen or twenty different waterworks. I have been consulting engineer of the Miami Conservancy district, headquarters at Dayton, Ohio, and was acting chief engineer at one time. That proposition involved an expenditure of about twenty-five million dollars. I will say that at one time, five years ago, I went to China for the Red Cross and the Chinese Government on the flood prevention works over in China. Of course I can give you a list that would cover several pages if you want it, but it seems to me this hasn't much to do with pumps. I don't care to say anything more than you gentlemen want; in fact, the less I say the better I am satisfied.

Q. That is sufficient on that head. The name of your firm is what, Professor?

A. Daniel W. Mead and Charles V. Seastone.

Q. And in what courses have you a chair as professor in the University of Wisconsin?

A. Hydraulic and sanitary engineering. I lecture more especially on hydraulic subjects; the sub-

(Deposition of Daniel W. Mead.)

ject of water supply and water power, drainage and irrigation, hydraulic machinery, on contracts and specifications.

Q. You have spoken of a certain letter or certain correspondence between yourself and Mr. Byron Jackson of the Byron Jackson Machine Works of San Francisco, as I remember, early in 1902. Have you any record of that letter?

A. I have copies of all my correspondence.

Q. Will you produce anything of that description, please, pertaining to that time, early in 1902?

A. I have here a copy of a letter that I wrote to Byron Jackson dated February 10th, 1902. [44]

(Witness produces a copy of such letter.)

Q. Where did you obtain that copy, please?

A. It's from my files.

Q. Where has it been since the copy was made?

A. It has been in my files.

Q. What did you do with the original of that letter?

A. That was sent to Byron Jackson, Esq., San Francisco, California.

Q. That is, it is a typewritten copy made at the same time? A. It's a carbon copy; yes.

Mr. BLAKESLEE.—We ask that this be copied into the record.

(Marked for identification Defendants' Exhibit "M-1.")

Mr. BLAKESLEE.—You can take copies of those letters, can't you?

Mr. LYON.—We will see about that before we get through.



(Deposition of Daniel W. Mead.)

WITNESS.—The only point is I don't want to break up my file.

Mr. BLAKESLEE.—I think counsel won't object to photostat copies.

Mr. LYON.—I can't answer that question until we have seen what they are. This one will be copied into the record with the same force and effect as if you offered the signed carbon copy which the witness has produced.

Said Defendants' Exhibit "M-1" was received in evidence and is as follows:

**Defendants' Exhibit "M-1."**

Feb. 10th, 1902.

Byron Jackson, Esq.,

San Francisco, Cal. [45]

Dear Sir:

Will you kindly advise me as to your ability to design a Series pump that can be placed in a 16" well, 150 ft. below the surface; same to be operated by an electrical motor to run at any speed you specify, preferably from 1200 to 1800 revolutions per minute. What quantity of water could you furnish by means of such a design?

I trust you will find time to answer this question at an early date, as if I can obtain a pump of this description which will raise from  $\frac{1}{2}$  to 1 million gallons from a depth of one to two hundred feet I believe I can find a place for a number of these pumps. I shall be greatly obliged for an early reply.

Yours very truly.

(Deposition of Daniel W. Mead.)

I expect to send you a drawing of the Fort Worth Shaft tomorrow.

Q. The original impression of this letter just produced was mailed by you, was it, to Mr. Jackson?

A. Yes.

Q. In the usual course of mails? A. Yes.

Q. Did you receive any letter subsequent to this or in reply thereto from Mr. Jackson? A. I did.

Q. Can you produce that?

A. I received a letter dated February 17th, 1902, from Mr. Jackson.

(Witness produces letter bearing date of February 17th, 1902.) [46]

Q. You received this in the usual course of mails, did you, Mr. Mead? A. Yes, I did.

Q. Do you know whose signature this is at the bottom? A. Byron Jackson's.

Q. You are acquainted with his signature?

A. Yes, sir. I have known him for years. I might say that I afterwards received a further reply to that same letter from Mr. Jackson.

It is stipulated that Exhibit "M-2" be received in evidence and copied into the record, as follows:

**Defendants' Exhibit "M-2."**

San Francisco, Cal., Feb. 17, 1902.

Mr. Daniel W. Mead,

1st National Bank Bldg.,

Chicago, Ill.

Dear Sir:

Replying to yours of the 10th, asking if we could design a series pump to be placed in a 16" well

150 ft. below the surface, same to be directly driven by an electric motor connected to the shaft to run at any speed between 1200 and 1800 R. P. M. It would not be a difficult matter to make such design that would fill the 6" pipe capacity from 500 to 800 gals. per min. We have already made a pump to go in a 10" well, capacity 300 to 400 gals., but we have not experimented but very little with this pump, so are not prepared to say as to the efficiency. There are some problems regarding the construction that we have not thoroughly thought of, but it can be designed to discharge directly into the center, of the shaft running through the pipe, thus to be coupled up and hung in the well by the pipe, [47] having no other frame work; but the difficulty in this problem is oiling the shafting and friction of couplings in water. It might be made with two discharge pipes and letting the bearing bars connect the two pipes, thus the two pipes become the frame, then all oiling could be done in the usual way and the diameter of the pump would be perfectly round, and just enough smaller than the well pipe to insure its free passage through the well pipe, and the diameter of the runner would be enough less than the diameter of the pump to permit the discharge back to the center—the same as any series pump. The question is how much money can we get for such pump? It can be made in either 3 or 4 series. Please let us know what the competition would be in this line of pump and if there is anything in it, we

(Deposition of Daniel W. Mead.)

are willing to undertake such a pump and guarantee it.

Yours truly,

BYRON JACKSON MACHINE WORKS.

Per BYRON JACKSON.

BJ/PL.

(Note by the Reporter.—The interlineation “& friction of couplings in water” above noted is made in the original letter in ink. The word “of” stricken out in this copy is stricken out in lead pencil in the original letter.)

Q. What was the further reply you have just mentioned in this connection?

A. My recollection is that Mr. Jackson was away about that time. I had occasion to write him again on March 13th and then again on March 31st. Mr. Jackson—he had been away—wrote me about various matters that I then had up with him, including certain discussion concerning vertical engines and rope transmission, [48] and incidentally he discussed small pumps and wall casings, and that is partially a further reply to my first letter and partially a reply to a letter I wrote him March 13th. That letter only refers, just a part of it refers to this case at hand, and part of it comes for instance, to the New Albany plant that I mentioned that he was supplying me, and certain discussions of methods of connecting shaft and engines.

Q. Is there anything in these last letters that you wish to keep in the secrecy of your files?

A. No, there isn't anything secret about any of

(Deposition of Daniel W. Mead.)

my letters. All I want is that they should be returned to me.

Q. You spoke of other business matters in them.

A. It isn't anything that I wish to keep secret in any way. You are perfectly welcome to read the whole mass of it. Here is a letter of March 18th, which is written by Mr. Boyer, and I don't think has anything pertinent in it. I am perfectly willing to have you look at it. Then here is a letter of March 31st, when Mr. Jackson got bank and *and* wrote me concerning that matter.

(Witness produces carbon copy of his letter to Boyer, and letter of March 31st, 1902, referred to March 18th, 1902, referred to by him as from Mr. Boyer, and letter of March 31st, 1902, referred to by him as from Byron Jackson.)

Q. This letter of March 13th, 1902, is a carbon copy also of the letter you wrote Mr. Byron Jackson? A. Of a letter I wrote Byron Jackson.

Q. Of that date? A. That date; yes.

Q. And this letter of March 18th, 1902, signed "Byron Jackson [49] Machine Works, per Boyer," was received by you in the regular course of mail? A. It was.

Q. And do you know the signature of Boyer attached to that letter?

A. Yes, sir. I met Mr. Boyer in San Francisco.

Q. And this letter of March 31, 1902 was received by you in the regular course of mail? A. It was.

Q. And the pencil addition to it, signed "B. J."—do you know what "B. J." means in that connection?

(Deposition of Daniel W. Mead.)

A. Well, it was Byron Jackson, and was simply a note that he added to it before sending it after it had been typewritten. There are two notes of that sort.

Q. And you are acquainted with those initials of Mr. Jackson?     A. I am; yes.

It is stipulated that the letter of March 13, 1902, or unsigned carbon copy thereof, may be received in evidence and copied into the record as Defendants' Exhibit "M-3" as follows:

**Defendants' Exhibit "M-3."**

March 13th, 1902.

Byron Jackson Machine Works,

San Francisco, Cal.

Gentlemen:

I have recently referred to you Mr. Edward S. Cole of John A. Cole & Sons of this city, who is looking for centrifugal pumps, and whom you will doubtless hear from within a few days. [50]

In regard to the small pumps for use in well casings, concerning which you wrote me a short time ago, I would say that there is at present no competition whatever in that line. I know of no pumps put in the wells the way I suggest in this country, but I believe there is a field for them, and I should be very glad to attempt their installation, if you can advise me closely as to the cost of their manufacture. You spoke of having built one for a 10-inch casing. Have you tried it and with what success? I shall be very glad to receive a copy of the test you refer to, and also am looking for a copy of your

new catalogue which I understood was to be out before this.

Concerning the question of rope transmission, would say my idea of using the shaft instead of the rope is largely based on our unfortunate experience at Rockford. Mr. Jackson stated before leaving for the coast that if he had to install another plant of the sort he should certainly use vertical shafting, and I have also been of the general opinion that at a depth of 170 ft. below the surface the length of rope would be so long as to make it undesirable and that therefore the shaft would be preferable. Am rather surprised to hear that Mr. Jackson now thinks otherwise. I should be glad to know Mr. Jackson's reasons for this change in views. Do you not think that the vertical shafting will run entirely satisfactory? Would like to hear fully concerning this before I decide on the type of pumps for Forth Worth.

Awaiting your further advice, I am,

Yours very truly.

It is also stipulated that the letter of March 18th may be received in evidence and copied in the record as Defendants' Exhibit "M-4" as follows:  
[51]

**Defendants' Exhibit "M-4."**

San Francisco, Cal., March 18, 1902.

Mr. D. W. Mead,

1st National Bank Bldg.,

Chicago, Ill.

Dear Sir:

Yours of Mar. 13th at hand. We note that you

have referred Mr. Edward S. Cole of your city to us for Centrifugal pumps, for which please accept our thanks. We received his letter this morning, but before we can make him an estimate it will be necessary to have further information and we are writing for same to-day. Regarding pumps to be used in well casing will say that we will refer this matter to Mr. Jackson to answer: Also the question of rope transmission for the Ft. Worth plant. Mr. Jackson is out of the city at present and expect him back in three or four days.

Yours truly,

BYRON JACKSON MACHINE WORKS.

Per BOYER.

W. E. B./W. C.

It is stipulated that the letter of March 31st, 1902, may be received in evidence and copied in the record as Defendants' Exhibit "M-5." [52]

**Defendants' Exhibit "M-5."**

San Francisco, Cal., Mar. 31, 1902.

Mr. Daniel W. Mead,  
1st National Bank Bldg.,  
Chicago, Ill.

Dear Sir:

Answering yours of Mar. 15th, which was received while I was in Los Angeles,—concerning the question of rope transmission, will say that I did not hesitate before I went to Rockford to recommend vertical shafting, because we have always had good luck with it. We have a great many plants with 100 ft. of shafting or more, and at present I am not sure that we have had some customers using



even 200 ft.; but it is self evident, that if they will run 100 ft. all right, they will run 200 ft., as each one is an independent shaft between the bearings. The balance device can be arranged to carry almost any load except this one item, that a thrust bearing or ball bearing must be provided to carry the total weight of shafting and fittings while the pump is running empty.

The Rockford plant, however, convinced me that rope transmission was quite practical. We proved that it was only necessary to have the engine run perfectly steady without any throbbing, because of lost motion on the center, which can be completely overcome by sufficient weight on the fly wheels and setting the crank of the engine at  $90^{\circ}$  instead of  $180$  as our Rockford plant,—the William's engine, the one I recommended, is made that way. It is also made with an outboard bearing, so that it can carry in addition to the fly wheel, the strain of the rope.

**EFFICIENCY:**—It is quite evident that the rope transmission will be more efficient than the vertical shafting with rope transmission combined as you have it; you will note that the rope transmission as you propose, takes in the trouble of both rope [53] transmission and vertical shaft and high speed. You will have your little troubles also with the number of guide pulleys you propose to make your rope twist from horizontal shaft on the engine to vertical shaft on pump.

**VERTICAL SHAFT:**—If adopted, requires some 15 bearings to be oiled and which require attention, and it will be a very difficult task to so

install these bearings that they will not throw any grease, which if they do, means a very dirty and disagreeable shaft to climb up and down, while the rope transmission avoids nearly all of this.

**ROPE TRANSMISSION:**—I think we demonstrated at Rockford that the shape of the grooves was secondary consideration, still it did seem to work better with a comparatively flat groove on the drive pulley at the top of the well and the sharp groove on the pump pulley at the bottom. I think we demonstrated conclusively that there was no danger of slip with a very slight tension on the bottom pulley by making a  $45^{\circ}$  groove. I think we also demonstrated that the groove had but very little to do with the vibration. We also demonstrated that the length of rope did not add to the vibration, but when we shortened the rope by putting in riding pulleys, the vibration was very violent and quicker.

It is true in our ordinary practice here in California, we do not recommend the rope drive for small pumping plants for several reasons,—First, the average countryman cannot splice a rope. Second, most all our wells will fill up with water and cover the pump, sometimes 20 or 30 ft. and even more; there is no effort made to seal the wells up. In fact, we have no foundation whatever with the pump; it is suspended by the frame and from the top, as the pump has to be installed and dropped into the well when it is full of water and we wait until we have pumped it out before we attempt to stay the frame to prevent its [54] vibrating when running; but in your case, your well is sealed per-

fectly dry. You must have rope transmission any way, and if you install it as your suggest, it takes a much larger engine room. It is not as compact and easily looked after as if you adopted the Rockford plant, besides I repeat again that I was east and could hardly believe the facts that the efficiency of the rope drive was as good as we demonstrated it. Besides in your case you have all the loss of the rope drive and all the loss in vertical shaft besides the horizontal engine and the horizontal pulleys will all give you more trouble than the vertical tighteners and vertical engine.

**VERTICAL ENGINE:**—Is much more efficient than a horizontal engine and if you are striving to make the best plant, I will unhesitatingly advise a first-class cross compound vertical engine and a vertical rope drive for Ft. Worth.

**COST OF PLANT:**—The Horizontal series pump and base will cost some more than the vertical pump, but it is more than made up in the saving of the vertical shafting and bearings. But the room occupied will have to be considered, which I have not done as yet.

I herewith inclose an illustration of a small 3 series pump on base, that will give you some idea of it, but of course it will not give you any idea of size. We have got the vertical, which you can lay down horizontal and estimate the length of it and rope pulleys, & 2 bearings.

**SMALL PUMP IN WELL CASING:**—We have never taken the time to work this out carefully in full detail, but have done considerable sketching, and herewith enclose 2 of them,—one where the

shaft is in the discharge pipe; the other where the discharge pipe is made in two and the shaft is run between them. This pump has to be coupled together and dropped in the well and supported from [55] the top. We believe it is quite possible to work out an efficiency and satisfactory pump, and the cost would not be greater than any centrifugal pump for the same purpose, as all pumps have to have vertical shafting or connecting rods and discharge pipes; but it is special work, and we have not done enough of it to make an offhand estimate. As I wrote you before, we made a 10" pump something on these lines, but we used propeller blades for a runner instead of centrifugal pump runners and while our test pumped a large quantity of water, we did not make a thorough test of efficiency, but we did enough of it so that we decided that the efficiency is not as good as the centrifugal runner and for this reason abandoned it; but we can just as well use the centrifugal runner which makes it but a trifle larger in diameter, but it gives us a much better opportunity to balance the weight of the shaft and make a more compact plant, besides we are dealing with something that we are continually having experience with, and can design a pump with some certainty as to its efficiency, capacity and balancing power. As soon as we get time, we propose to enter upon a thorough experimenting with pump and test. We propose to manufacture a pump and thoroughly test it, when we will be able to give you definite information.

NEW ALBANY PLANT:—I am satisfied this will be all right. As that is direct connected to

motor and by setting it vertical, you do away with all belts or ropes and avoid putting the motor down in the damp well where the motor might be injured.

I am pleased to announce that they are packing your pumps for shipment to-day and regret that we could not ship them sooner, but believe that you will find them a first-class piece of work. We will send shipping receipt under another cover, & some *detale* Drawing & Specification how to install & [56] opperate.

Yours truly,

BYRON JACKSON MACHINE WORKS.

Per BYRON JACKSON.

BJ/PL.

P. S.—Enclosed I hand you efficiency test of the Compound pump installed for the Bay Counties Power Co. which I wrote you about, also another test of an 18" 10,000 gallon pump that I sold to the Spreckels Sugar Co. at Spreckels, Cal. This test was made by the Sugar Co., their manager being a very competent man and testing it for his own information, so I think it is perfectly trustworthy. The Bay Counties Power Co. was tested by their experts, supervised by Mr. Vandegrift, who is an employee of mine and occupies Mr. Perry's position. I will send thise also under sepparate cover—as I have no coppies at this office.—B. J.

(Reporter's Note: The phrase "& 2 bearings" on page —— is in lead pencil. The words "& some *detale* Drawing & Specification how to install &

(Deposition of Daniel W. Mead.)

operate" on the bottom of page — are also in lead pencil.) [57]

Q. I notice, Mr. Mead, that this letter from Mr. Jackson, being Defendants' Exhibit "M-5," dated March 31, 1902, refers on page 3 to "sketching" and says "and herewith enclose two of them." Do you know what became of those sketches?

A. Why, I don't; it is possible that they are still in my records. We have recently moved and my records are, as far as drawings are concerned, pretty well scattered. I remember quite distinctly two sketches—they were not exactly what we call sketches, they were really outline drawings, what we would call outline drawings, that is, mechanical drawings, that were made in Mr. Jackson's office and sent. I don't remember whether they were enclosed in that letter, but I do remember very distinctly our receiving them—or my receiving them, either at or about the time I received this letter.

Q. You don't know where they are to-day?

A. I don't know where they are to-day, no.

Q. Have you or have you not made a search for them?

A. I can't say that I have made an absolute, thorough search; I have lots of drawings up at my University office that I simply haven't had time to go through, and I don't know whether it's there or not.

Q. Would it be a great task to refer to those before you leave the stand, in this matter?

A. Well, it would be a very large task. I don't know whether I could do it or not.

(Deposition of Daniel W. Mead.)

Q. Nobody could do it for you?

A. No, I don't believe they could. I could have somebody try, but if they said they couldn't find them I wouldn't feel satisfied whether they were there or not. Things of that sort. I wouldn't feel satisfied with anybody's search except my own.  
[58]

Mr. LYON.—If the witness is to give any testimony whatever in regard to such original sketches or drawings, we, of course, would demand the production of the originals if they are in his possession. We do not make this to inconvenience the witness but we desire the original evidence itself if it is available.

WITNESS.—I simply say this, I have got quite a lot of drawings up at the University. Now, I am perfectly willing to send one of my men up there and have him look through them. I know just what the drawing were, and I think he would recognize them from my description. I presume I could have that done perhaps this afternoon or to-morrow. In fact, I don't know, but possibly I could send my own son up there, he is out of the University just now, it is vacation, and I can have that done if you wish.

Mr. LYON.—I would like very much to have the originals if you possibly could produce them.

Mr. BLAKESLEE.—If you can discover them, of course.

WITNESS.—Well, I never throw away a thing of that sort and I don't like to say I haven't got

(Deposition of Daniel W. Mead.)

them, because you can see I have got my letters back for a good many years.

Q. Would it be possible for you to start that search now as we shall be briefly taking an adjournment, and you ought to be excused until after Mr. Clasman testifies, so that you can give us a return on that search by three or four o'clock this afternoon? A. I couldn't say.

Q. Will you do the best you can?

A. I will do the best I can.

Adjournment 12:15 P. M., by consent, until two o'clock P. M. [59]

2:00 P. M.

Parties appear as before and the following proceedings were had:

Mr. LYON.—Note this objection on the record, that William A. Clasmann of Milwaukee, Wisconsin, having appeared here at the request of the defendant, as counsel for plaintiff, having agreed as a courtesy to permit the interruption of the deposition of Mr. Mead to take the deposition of Mr. Clasmann at this time, defendants now announce that they will not take the deposition of Mr. Clasmann and he is excused from attendance. Plaintiff's counsel requested leave to take the deposition of Mr. Clasmann on behalf of plaintiff at this time, such leave being refused, although the witness Mead is not in attendance. Plaintiff objects to any waiting for the witness Mead to appear, and gives notice that any delay in the proceedings will be brought to the attention of the Court and Special Master on the question of imposition of costs.



Mr. BLAKESLEE.—Counsel for plaintiff's remarks will commence before the hour of two o'clock, and prior to their utterance we were attempting to get Mr. Mead on the phone. It is now two o'clock, and we shall repeat for the third time that attempt. His delay in appearing, if there be any substantial delay, is due to two reasons, the first of which was that he was to examine his records to endeavor to find some drawings about which he testified at the morning session. The second is, that we had never met Mr. Clasmann, and while expecting to call him, have concluded not to interrupt the deposition of Mr. Mead for that purpose and shall continue it as expeditiously as possible and probably not call Mr. Clasmann. We will now endeavor again to get Mr. Mead on the phone and get him here as soon as he can arrive. His office is only a block and a half [60] or less from this place.

After a brief intermission:

Mr. BLAKESLEE.—We have reached the witness Mead by phone and he states that he is conducting a search for these original drawings which both parties wish produced by him, and has two men working on the matter with him now. He hopes to be able to produce such drawings at three o'clock, less than one hour from now, and for no other purpose than to enable him to produce this primary evidence as requested by counsel for both parties, we are forced to suspend proceedings further until the hour of three o'clock P. M.

Mr. LYON.—We object to the suspension of the proceedings. Counsel has had two weeks in which

to prepare for the taking of this deposition, and should not interrupt the taking of the deposition in this manner. Search for the alleged drawings can readily be made after the usual hours for taking depositions.

Mr. BLAKESLEE.—This is not, we presume, to be an argument on the record, in violation or contravention of the equity rule pertinent to such things, but both sides seem to be of a mind to make statements at this juncture, and we wish to further observe that we are doing all we can at this great distance from the master's court and upon our first day in Madison on this matter, to promote this deposition of Mr. Mead's by producing the very best evidence he has. We regret the delay, but it seems necessary to the ends of justice, and we shall attempt to conclude our depositions in the east as promptly as possible for the accommodation of counsel on the other side as to any rebuttal depositions he may wish to take in this section [61] of the country. The present delay is quite an ordinary delay in matters of this sort, and is only necessitated by the fact that, as the witness has stated, he has to go outside of his own record at his own office and consult those of the Wisconsin University, which we understand he is now doing.

Mr. LYON.—The statement of counsel is objected to as not evidence, and if he wishes the statement to stand as a statement of fact we demand that it be produced in the regular order of producing evidence.

Mr. BLAKESLEE.—This statement, as far as

(Deposition of Daniel W. Mead.)

the search being made by the witness is concerned, is predicated upon the testimony of the witness given this morning. The procedure as defendants are conducting it in case E-42 is strictly in pursuance of the stipulation under which we are proceeding here, to wit, that defendants' depositions should be concluded prior to the taking of any depositions by plaintiff.

Mr. LYON.—The stipulation does not so read, as plaintiff's counsel reads it.

Mr. BLAKESLEE.—We stand on the stipulation as it reads.

The deposition was continued by the reappearance of the witness DANIEL W. MEAD at the hour of 2:55 P. M., at the same place and present as before.

Q. Prior to the noon recess, Professor, you were asked to make a search through any records available to you to attempt to unearth the sketches or drawings which you stated accompanied the letter from Byron Jackson, of the Byron Jackson Machine Works, of March 31, 1902, Defendants' Exhibit "M-5." Please state what you have done in that connection. [62]

A. Well, I had already made a search through my office files previous to this morning, but have found nothing. Since then we have moved our office—

Q. You do not mean since this morning?

A. Since the former search which was made in December, 1919, we have moved our office and have refiled all of our blue-prints and drawings and have gone to each drawing in our office one by one and classified them in their proper position, so that I have

(Deposition of Daniel W. Mead.)

again gone through the drawings and examined all of the drawings which I had of the Byron Jackson Machine Works. I did not find either of the so-called sketches or what I call preliminary drawings among those files. I had already looked at my house, where I have a few drawings. I made a personal research there and found nothing at that point. The only point where I had not searched was my office at the University. I sent my son, together with one of my principal assistant engineers, who has been with me for about fourteen years and who is particularly familiar with pumps, to the University office, gave him my keys and instructed them where they could find the drawings. They have just reported that they went through each blue-print at the University office. They were instructed to bring anything with Byron Jackson's name attached, or that looked like a centrifugal pump, and all they were able to find was some drawings of a centrifugal pump designed by Mr. J. W. Alvord. They were unable to find anything there. So I am satisfied that in my moving from Chicago to Madison the original sketches have become lost or destroyed and that they are not in my possession anywhere.

Q. Is there any other direction in which you could expect possibly to find those drawings?

A. I don't know of a single place. [63] I have looked every place where I would keep everything of that kind, and I don't believe I have them.

Q. Now, will you please state to the best of your recollection what was the disclosure of those drawings received by you from Byron Jackson accom-

(Deposition of Daniel W. Mead.)

panying that letter of March 31st, 1902?

Mr. LYON.—That's objected to as incompetent, no foundation laid for the introduction of secondary evidence, and as not calling for the best evidence.

A. There were two blue-prints that came, either with that letter or under separate cover, I am not positive in regard to that, but they were received about the same time, and were called by Mr. Jackson "sketches." Each of them had a title saying they were made for Daniel W. Mead and dated, as I recall it, along in March previous to the date of the letter. They were two entirely separate types of pumps—separate as regards the discharge features. One of them, as I recall it, had two discharge pipes that joined the series pumps down in the well and again joined in a common discharge at the surface. The shaft in this case went down to the well between the two discharge pipes and entered the pump-case through a packing gland. The shaft had bearings attached to the two discharge pipes. So that the whole thing could be lowered into the well and supported from the surface, the two discharge pipes furnishing really the support, and also guiding the shaft which was to drive the pump. The other sketch was differently arranged; with the same series centrifugal pumps at the bottom of the well, or down in the well, that discharged into a single discharge pipe, but contained an inner pipe which in turn enclosed the shaft, the discharge being outside of the inner pipe and inside of the outer pipe. Then the bearings [64] were contained inside of the outer pipe; in fact, as I recall it, going clear through and joining

(Deposition of Daniel W. Mead.)

the two pipes together and holding the shaft rigidly in place. The shaft that attached to the driving head above entered the center pipe and left it, entered the pump below and separated it from the discharged water. So that in both cases there was no contact between the water discharged by the pump and the shaft.

Q. Will you please look among the various papers and blue-prints upon the table here and see if you find any such drawing as last mentioned or described by you.

Mr. LYON.—Before the witness does this I would like to ask him a question, if he has not been shown a number of blue-prints by counsel for the defendant and shown them here to-day before he took the stand.

Mr. BLAKESLEE.—I object to the question as immaterial.

A. I have.

Q. Now, please so do.

A. Among these blue-prints on the table I find out which was one of the original so-called "sketches" that Mr. Jackson sent.

Mr. BLAKESLEE.—Witness picks out blue-print numbered at the bottom 1-C-75, over all of the written and numbered or figured data at the lower right-hand corner of which a blank sheet of paper is pinned to obscure such reading.

Mr. LYON.—I think the Professor's answer is ambiguous. He says: "One of the original drawings or sketches sent." So that we will know what he means, ask him sent when.

A. Sent either with or under separate cover, in

(Deposition of Daniel W. Mead.)

connection with Byron Jackson's letter of March 31st, isn't it?

Q. The letter you last mentioned, was, yes, 1902.

A. March 31st, 1902. [65]

Q. What resemblance is there between this blue-print you have selected and either of said sketches or drawings you have referred to as accompanying the last mentioned letter from Mr. Jackson?

A. Well, to the best of my knowledge and belief it's identical with the last one I described.

Q. How, with respect to size and dimensions of the parts shown on this blue-print, how do they compare as you recollect with the dimensions and sizes on the drawings you so received?

A. As near as I can recall they are identical. I couldn't swear to every dimension, but as I recall the sketch at this time it is identical with the original print sent me with Mr. Jackson's letter of March 31st, 1902. It is not in great detail, but shows the general character of the construction he proposed. I might add that this is also the drawing that was afterwards discussed by Mr. Jackson and myself in May and early in June of the same year in San Francisco.

Mr. BLAKESLEE.—Defendants offer in evidence the blue-print just selected by the witness, as Defendant's Exhibit "M-6," and ask the same be so marked. It is believed, for the purpose of assisting the reading of the record of the witness in this case, that this will be found to agree exactly with Defendants' Exhibit 3, and to be a blue-print thereof.

Mr. LYON.—Objected to as incompetent, not the

(Deposition of Daniel W. Mead.)

best evidence, no foundation laid for the introduction of secondary evidence.

Mr. LOFTUS.—Q. I hand you a blue-print which I have had marked for identification Defendants' Exhibit 1 and ask you how the same compares with the [66] one you have just identified in the previous answers and which has been offered in evidence as Defendants' Exhibit "M-6."

Mr. LYON.—Objected to as incompetent, not the best evidence, no foundation being laid for the introduction of secondary evidence, not the proper method of proof.

A. The two are identical.

Mr. LOFTUS.—In view of the refusal of counsel for complainant to stipulate that copies of exhibits offered in the Equity case No. E-42, duly certified by the notary, may be used in the case in the Western Well Works with the same force and effect as the original exhibits, and furthermore in view of the fact that there necessarily can be but one original, counsel for defendant Western Well Works offers a blue-print which the witness has just identified, and this produces the same in evidence as Defendants' Exhibit 1.

Mr. LYON.—Objected to as incompetent, not the best evidence, no foundation laid for the introduction of secondary evidence, not properly identified, not the proper method of proof.

Mr. BLAKESLEE.—Q. When did you first meet Mr. Byron Jackson, Mr. Mead?

A. Some time during the summer of 1896.

Q. And when next, if at all?



(Deposition of Daniel W. Mead.)

A. Well, the next time, he came on to Rockford when his engineer Mr. Perry was installing the Rockford plant. They had some trouble in installation and Mr. Byron Jackson spent—oh, I should judge six weeks or two months in Rockford trying to get the machinery in satisfactory running condition.

Q. And ever again after that? If so, when?

A. I don't remember meeting Mr. Jackson again until the latter part of May, 1902, although I had had extensive correspondence with [67] him and it is possible that I may have met him. I don't remember. I was not at San Francisco and he may have been in my Chicago office. I don't know whether he was or not.

Q. Where did you meet him the latter part of March, 1902? A. Not March, 1902.

Q. I beg your pardon. May, 1902.

A. I met him in his office in San Francisco.

Q. Under what circumstances?

A. He had already, I think, at that time contracted to build for me two pumping units for Ft. Worth, Texas, and I went out to see him primarily on account of those particular units. I was then at work at Ft. Worth, and I left Chicago in the latter part of May, arriving at San Francisco, so that I think I spent the last two days in May and perhaps the first two or three days of June. Then I went on to Los Angeles, and from Los Angeles over to Ft. Worth, where I was working.

Q. Have you any record or entry of any kind that would tend to fix or locate the date of that trip last

(Deposition of Daniel W. Mead.)

mentioned to San Francisco?

A. Yes, I have a diary in my office that gives my movements and gives that date; gives the date that I left Chicago and arrived in San Francisco, and when I left San Francisco and arrived in Chicago.

Q. When did you last consult that diary?

A. I looked it up within a month.

Q. As to those dates? A. Yes, sir.

Q. Now, did you have any talk or discussions with Mr. Byron Jackson in the latter part of May or first part of June, 1902, in San Francisco? [68]

A. Yes, I spent two or three days discussing various matters with him.

Q. Did you talk about pumps?

A. Yes, entirely on the subject of pumps as far as I recall. I don't remember any other subject we were discussing except pumps and their connections and methods of using centrifugal pumps on the class of work that I was doing.

Q. Was any reference made on that occasion, on any of those days in the latter part of May or first part of June, 1903, to the matter of your correspondence which you have testified to, accompanying one letter of which correspondence you received these two sketches which you have described.

A. Yes, that matter was discussed quite fully.

Q. Please state fully what was said in those discussions, giving the language used as far as you can remember it, and in all other respects state the substance of those discussions.

A. Well, the two plans that Mr. Jackson had submitted were discussed, the first one I described, of

(Deposition of Daniel W. Mead.)

the two discharge pipes, I objected to, because the pipes were so small that I thought the friction of discharge would be considerable, and I didn't like the arrangement. The last one described, of which the blue-print Exhibit "M-6" is a copy, I didn't understand fully, and we discussed that at some length. I did not appreciate the necessity of an inner pipe, and raised the objection that it added to the expense and inquired why it was used. Mr. Jackson called my attention to the fact that in deep wells frequently more or less sand is discharged, and that the sand coming up in the water was apt to get in the bearings and destroy the bearings. Another point that he made was that water lubrication was not [69] satisfactory and that the bearings should be lubricated with oil. The third point was that the friction of the moving shaft in the water decreased the efficiency, and that altogether he thought that the efficiency and durability of the pump would be greatly increased by the use of this interior pipe that kept the shaft away from the discharged water. I remember in that connection that my attention had been called—I don't know that it had been called by Mr. Jackson, but it had been called in connection with my professional practice, to the fact that the Wood propeller pump, manufactured at Los Angeles, had its bearings in the water, and that the bearings had frequently cut out, and when I visited Los Angeles on that trip, I believe it was, I visited an exhibit at the plant of the Wood propeller pump and discussed with them somewhat their particular plan. They had a pump in a store down somewhere in Los An-

(Deposition of Daniel W. Mead.)

geles. I am not familiar enough with Los Angeles to know the exact locality, and had a little exhibit where they pumped from one basin into another. Of course they only raised the water two or three feet there, but it showed the action of the pump. That pump was not a centrifugal pump; it was simply a series of propellers, a good deal like the propeller on a launch, that were replaced as I recall it about six feet apart, but an intermediate bearing; the intermediate bearing being not only for the purpose of a bearing, but also for the purpose of interrupting the tendency for the whole body of water to take up a circular motion instead of raising it to the surface. There were rather flat pieces, more like a spring, bent somewhat in the form of a letter S, so that when they were compressed they would go into the pipe and then they would spring out against the pipe. My recollection is they were about four inches long, so that when [70] the water came in contact with them it had to go longitudinally with the direction of the pipe and couldn't rotate with the direction of the shaft and propeller. That was one of the particular features of that particular pump.

Mr. LYON.—I move to strike out the answer and each part and parcel thereof, each sentence and each phrase, from the record, and exclude it from consideration, on the ground that it is not responsive to the question and upon the further ground it is simply the belief of the witness and not competent.

Mr. BLAKESLEE.—We call the master's attention to the first portion and large portion of this

(Deposition of Daniel W. Mead.)

answer, which it is submitted is directly responsive to the question.

Q. Do you remember any further details of those discussions or talks with Mr. Byron Jackson in the year 1902 at San Francisco concerning the nature and structure of this propulsion pump you discussed with them?

A. No. I don't remember any further discussion concerning the suction pump. I remember of some other discussion concerning the pump in its application to my particular work.

Q. Now in an answer a little while ago you referred to bearings, which as I remember it, were to be within this enclosing tubing surrounding the shaft. From what source did you first learn of such bearings?

Objected to as leading and suggestive and not the proper method of examination.

A. I learned concerning the details from Mr. Jackson. The original drawing was not in sufficient detail to tell about the arrangement of the bearings and that was a matter that was discussed in San Francisco. [71]

Q. At the time you have mentioned?

Mr. LYON.—Same objection.

A. In the latter part of May or first part of June, 1902.

Q. Please state what was said in that discussion or give the substance of such discussion.

Same objection.

A. Well, it was simply an explanation on the part of Mr. Jackson as to why he wanted the bearings en-

(Deposition of Daniel W. Mead.)

closed and separated from the water, and how he proposed to do it.

Mr. LYON.—I move to strike the answer from the record and exclude it from consideration upon each of the grounds stated in the objection; upon the further ground that it is a mere conclusion of the witness, not the proper method of proving a conversation, not competent.

Q. Do you remember what was discussed in any statement by Mr. Jackson at that time of his proposal in these respects; and if so, please state the same, or the substance thereof if you can't get the words.

Mr. LYON.—Same objection, and is not the proper method of proving a conversation.

A. I do not remember the details of the discussion, but only the discussion in a very general way, as the matter was at that time not applied to any particular job, but only to anticipate work along the line of water supply.

Q. Do you remember the substance of what was said about the bearings?

Mr. LYON.—Same objection, as leading and suggestive.

A. I remember the statement that the bearings of the shaft were to be located inside the central pipe and so that they could receive oil from the surface and be free from the action of [72] either standing water or water discharged by the pump, and the bearing plates were also to act as a separator between the outer pump and the inner pump and to give, together with the pipes, a continuous connection from the drive head above to the pumps below.

(Deposition of Daniel W. Mead.)

Q. In two places in your last answer you have referred, in one place to "inner pump" and in the latter place to "outer pump." Please state what you meant to convey in those respects.

A. Well, I should have said "inner pipe," inner and outer pipes; referring to the discharge pipe and the inner pipe that contained the shaft.

Q. Now, after you left California, what, if anything further, was done about this matter of centrifugal pumps and pump shaft with enclosing tubings, about which you have testified?

Mr. LYON.—That is objected to as leading and suggestive and assuming facts not testified to by the witness.

Mr. BLAKESLEE.—Add on there "that is, within your own knowledge."

Mr. LYON.—The objection is repeated.

A. I had no further correspondence or communication with Mr. Jackson concerning this particular type of pump until in the spring of 1903, when I was called in by the Pabst Brewing Company to consult with them as to the best method of securing a water supply for the wash water used in their brewery. In that connection I called the attention of Mr. Pabst to the correspondence and conversations which I had had with Mr. Jackson—

Mr. LYON.—We object to the witness detailing conversations with third persons, not in the presence of either Mahlon E. Layne or anyone connected with or representing the plaintiff corporation. [73]

Mr. BLAKESLEE.—We object to counsel's interrupting the witness. The purpose is obvious.

(Deposition of Daniel W. Mead.)

We insist that counsel follow the orderly procedure of objection or motion if he has any desire so to do and not to interrupt the witness during the statement of his answers.

Mr. LYON.—We object to the statement of counsel for the defendant in so far as it attempts to impute to counsel for plaintiff any desire to interrupt the witness. We insist the witness confine his answers to competent matters, and it is clearly incompetent for him to testify to conversations which he had with third parties not in any manner connected with this litigation, and not in the presence of anyone representing the plaintiff in this case, and insists that the procedure is correct in interrupting the witness, so as to preserve the record.

Mr. BLAKESLEE.—We object to counsel arguing on the record and insist that the witness be not interrupted during his answers, as obviously there is no one here to rule upon any such procedure, and counsel should withhold any objection he may make to the answers until the answer is completed, or object after the question.

Mr. LYON.—If counsel for defendants in case E-42 is taking this deposition *de bene esse* and it is to be read and objected to question and answer before it becomes a part of the record in E-42, the situation would be different from what has been the understanding of counsel, and I request that counsel for the American Well & Prospecting Company indicate his understanding in this regard.

Mr. BLAKESLEE.—We only insist that counsel permit the answers to be uninterrupted, and if he



(Deposition of Daniel W. Mead.)

is dissatisfied with them [74] he has his remedy by motion to strike out at the end of the answer.

Mr. LYON.—We insist that the procedure is proper, as the witness in all court proceedings in giving an answer which is incompetent is subject to being interrupted and this is why the objection to the incompetent portion of his answer is made of record.

Mr. BLAKESLEE.—We insist that the interruption is not proper and that the witness be given the chance to express himself in answer in continuity.

(Last portion of answer of witness read, as follows: "In that connection I called the attention of Mr. Pabst to the correspondence and conversations which I had had with Mr. Jackson—")

A. (Continued.) —and advised Mr. Pabst that I thought Mr. Jackson could design and build a centrifugal pump which would be capable of raising about a million gallons per day of 24 hours from a well that was then being built at the Pabst Brewery and in which a reciprocating pump had proven a failure as far as its ability to secure the desired quantity of water. This reciprocating pump had been placed in there and was not satisfactory. In that connection Mr. Pabst authorized me to write Mr. Jackson and see if he would undertake such design—which I did.

Q. Do you remember when you wrote Mr. Jackson in that regard?

A. Well, I have the letters here. I simply remember that it was early in 1903. As near as I can

(Deposition of Daniel W. Mead.)

recall, it was in April. I am not quite positive in regard to the date, because it is a good while ago.

Q. Can you produce that letter you have referred to? A. I can.

Q. Please do so. [75]

A. I wrote two letters to Mr. Jackson, or the Byron Jackson Machine Works, both dated March 18th, 1903, and both in regard to the Pabst Brewing Company, one contained some other matters as well.

Mr. BLAKESLEE.—Witness produces what are apparently carbon copies of letters both dated March 18th, 1903, and addressed to the Byron Jackson Machine Works. It is stipulated that the shorter of these letters may be now copied into the record as Defendants' Exhibit "M-7." It is further stipulated that the longer of these letters as produced by the witness may be received in evidence and marked Defendants' Exhibit "M-8" and copied on the record as follows:

**Defendants' Exhibit "M-7."**

March 18th, 1903.

Byron Jackson Machine Works,

San Francisco, Cal.

Gentlemen:

In connection with the enclosed letter asking for bid on a pump for the Pabst Brewing Company, I would especially call your attention to the fact that the Pabst Company now have a number of deep well pumps which they will gladly replace by a centrifugal pump should this prove as successful as I believe it will.

I would also call your attention to the fact that there are numerous other places in this neighborhood where a pump of this nature can be installed, provided one successful installation can be shown.

I believe I sent you some days ago a catalogue of [76] Hart & Co., who are apparently experimenting in this line. Their work has been entirely experimental, and they have no plant in successful operation. They are also afraid to guarantee any reasonable results.

The main question with the Pabst Brewing Co. will not be "How cheap," but "How good," and while it is essential that the cost should be a reasonable one, I would particularly ask you to figure on first-class work, on which we can absolutely depend.

I am notified from Fort Worth that the pumps for that place have been received. It will probably be about thirty days or more, however, before we will begin to install them.

Yours very truly.

**Defendants' Exhibit "M-8."**

March 18th, 1903.

Byron Jackson Machine Works,

San Francisco, Cal.

Gentlemen:

The Pabst Brewing Co. of Milwaukee are obtaining a portion of their water supply from deep wells. They have experimented with various deep well pumps which have not given entire satisfaction.

I have been called in to advise with them con-

cerning a pump to install in a well which is just about completed. This well is 15 inches internal diameter for a depth of 200 ft., and is expected to furnish somewhere from 700 to 900 gallons a minute at this depth. [77]

I have told Mr. G. G. Pabst concerning the deep well centrifugal pump which I have discussed with you at various times, and have affirmed my belief that you could build a series centrifugal pump for this service which would be economical and durable in operation. Mr. Pabst has requested me to write you and explain this matter in detail to you, and ask you to make us a proposition for furnishing a pump capable of raising at least 700 gallons a minute from a depth of 220 feet. We should desire you to make us figures on both the pumps themselves and the shafting and piping necessary to suspend the pump in the well, and to connect it with the motor at the surface. Our idea is, for the present, to operate this pump by quarter turned rope drive and steam engine, and we would be able, with the engine, to give sufficient variation in speed to give the pump the speed found most desirable within, of course, reasonable limits. We should want special attention given to the arrangement of the bearings and shafting, so that the pump would be both carefully balanced and remain in perfect alignment, and, for this reason, would prefer to have you figure on the drop piping and shaft, as above mentioned.

We would also like a guarantee from you that an engine of a given horse power will operate the pump under the conditions stated, and that you will

(Deposition of Daniel W. Mead.)

guarantee the pump for twelve months' operation.

I shall be glad to hear from you at an early date with a proposition as above outlined, and a sketch of your general arrangement of shafting, bearings, etc.

Yours very truly.

Q. Where have these carbon copies been, Professor, since the [78] letters were written?

A. They have been in my files.

Q. And the letters themselves were mailed in the usual course of mail? A. They were.

Q. And they were written on the dates that appear on the top of them? A. They were.

Q. What, if anything, do you know about the well or wells referred to in this longer letter, Defendants' Exhibit "M-8"?

A. My knowledge is that it was drilled by Gray Brothers of Chicago, who had the contract for both drilling the well and furnishing the pump, and they, with Mr. Pabst's consent, got me to go up and see if I could devise some way in which the water could be guaranteed and obtained from that well. I had nothing to do with the drilling of the well and simply went up there in the spring of 1903 to see if anything could be done to get the desired results.

Q. Do you know what the diameter of that well was?

A. My recollection is it was something like 15 or 16 inches, down for I think about 200 feet, and I remember that we were to have a suction pipe extend down below the pump, so that I think the

(Deposition of Daniel W. Mead.)

maximum lift to get at least 700 gallons a minute was possibly 220 feet. We thought that an extra 20 feet might be reached by suction if necessary.

Q. Did you ever hear anything from Mr. Jackson about this matter after that?

A. I did, with some delay. I wrote him again on April 1st, not having heard from him, and wired him on April 8th concerning the same matter.  
[79]

Q. Have you any record of that letter and that wire? A. I have.

Q. Please produce same.

A. The letter is dated April 1st, 1903, and the dispatch dated April 8th, 1903; both in regard to the bid I had asked him to make on the Pabst pump.

(Witness produces apparently carbon copies of a letter dated April 1st, 1903, and the Western Union Telegram dated April 8th, 1903.)

Q. Where have these copies been since the letter and wire were transmitted by you?

A. Been in my files.

Q. And did you transmit the original in the usual course of mails and telegraph? A. I did.

(It is stipulated that this letter and this wire of April 1st and April 8th, 1903, respectively, may be received in evidence as Defendants' Exhibits "M-9" and "M-10," respectively, and copied in the record as follows:)

(Deposition of Daniel W. Mead.)

**Defendants' Exhibit "M-9."**

April 1st, 1903.

Byron Jackson, Esq.,  
San Francisco, Cal.

Dear Sir:

Will you kindly send us figures on the pumping plant for the Pabst Brewing Company as early as possible.

Had expected to hear from you some days ago concerning [80] this matter.

Yours very truly.

**Defendants' Exhibit "M-10."**

THE WESTERN UNION TELEGRAPH  
COMPANY.

April 8th, 1903.

To Byron Jackson Machine Works,  
San Francisco, Cal.

When can I expect proposition on pumps for Pabst.

DANIEL W. MEAD.

Paid.

Q. What, if anything, transpired in these matters after that?

A. On April 8th I received a dispatch from the Byron Jackson Machine Works, which dispatch I have in my files.

(Witness produces what purports to be a Western Union Telegraph dispatch dated April 8th, 1903, and signed Byron Jackson Machine Works.)

Q. This was delivered to you, was it, in the usual course of telegraphs? A. It was.

(Deposition of Daniel W. Mead.)

Q. And where has it been since that time?

A. In my files.

Q. Received on the date given?      A. It was.

It is stipulated that this telegram, omitting the printed form heading and other data, except the date, address, [81] substance and signature, may be received in evidence as Defendants' Exhibit "M-11" and copied into the record as follows:

**Defendants' Exhibit "M-11."**

San Francisco, Cal., April 8th, 1903.

To Daniel W. Mead,

1st National Bank Building.

Mailing proposition on pumps for Pabst today.

BYRON JACKSON MACHINE WORKS.

Q. What, if anything further, transpired in this matter?

A. Some days after, I can't remember the date—I haven't been accustomed to marking the date of receipt on my letters—I received a letter from Mr. Jackson dated April 8th, 1903. This, by the way, has been copied by photostat.

It is stipulated that this letter of April 8th, 1903, marked Defendants' Exhibit "M-12," may be received in evidence and copied into the record as follows:

**Defendants' Exhibit "M-12."**

San Francisco, Cal., April 8, 1903.

Mr. D. W. Mead,

Chicago, Ill.

Dear Sir:

We are in receipt of your letter asking for quo-



tation on deep well centrifugal pump for Pabst Brewery; pump to have a capacity of 700 G. P. M., water to be pumped from a 15" bored well 220 ft. deep. For this service we take pleasure in itemizing and quoting as follows: [82]

- 1—Series Jackson vertical centrifugal pump having a capacity of 700 G. P. M.
- 200—ft. of 1 7/16" shafting.
- 10—1 7/16" special couplings.
- 20—1 7/16" spreader bars with self aligning boxes.
- 400—ft. of 5" casing for vertical discharge.
- 35—ft. of 8" casing for suction.
- 1—Patent S. O. top pulley frame.
- 1—Pulley for same.

Necessary oiling pipes to connect to oil the bearings delivered F. O. B. cars San Francisco for the sum of \$1,500.00.

We enclose blue print showing a rough design of a vertical centrifugal pump 600 G. P. M. 100 ft. In your case we would use 2-5" casings for discharge pipe, one on each side of the shafting. This, of course, is somewhat of an experiment and we would test the pump here before shipping and same would have to be accepted at our works. Should you require us to send a man to Milwaukee to install the plant and put same in operation, the price would be \$2,000.

As to the efficiency, we would obtain on this pump, we cannot say until after we have tested it. We presume, however, you should provide for about 75 or 100 HP.

Mr. Jackson says he would not care to take the

(Deposition of Daniel W. Mead.)

order at this time and guarantee the results for a year, but would accept an order for such a plant contingent on the drawings and plans being satisfactory, and if so, would construct the pump and test it and if the efficiency was satisfactory and your company willing to accept the plant F. O. B. San Francisco, after a thorough shop test, showing the capacity and power required under a given head which should be measured by correct gauges and the power by [83] a dynamometer pulley and the pump showing a satisfactory efficiency, we would then construct the balance of the discharge pipe and shaft according to plans and deliver the pump, and the party should accept it at our works and pay the money for it and take the chances of operating it himself.

Yours truly,

BYRON JACKSON MACHINE WORKS.

Per BOYER.

WEB/PL.

P. S.—We estimate that the plant without the casing pipe would weigh between 4,000 and 5,000 lbs., and the freight would be approximately \$150. We have figured in the casing pipe for discharge on this plant, but would buy it in the east and have it delivered at Milwaukee. Should you prefer furnishing the casing pipe yourself, we would deduct it from the above bid.

Q. Did you receive this letter, Defendants' Exhibit "M-12," in the usual course of mails?

Objected to as leading and suggestive.

A. I did.

(Deposition of Daniel W. Mead.)

Q. Do you remember how soon after this date you received it?

A. Well, I know that it was before April 14th—on or before.

Q. Of that year?      A. Of 1903.

Q. And where has this letter been since you received it?      A. In my files.

Q. In relation to the signature in writing per a name that appears to be Boyer, do you know that signature?      A. I do.

Q. It is the signature of whom?

A. Why, one of Mr. Jackson's assistants, that I had frequent correspondence with. [84]

Q. I notice in this letter, Defendants' Exhibit "M-12," a reference to "5-inch casing for vertical discharge," and a later reference to "8-inch casing for suction." Can you tell me what those items mean?

Mr. LYON.—We object to the form of the question as leading and suggestive, and as incompetent, not the best evidence, no foundation laid for the introduction of secondary evidence.

A. No, I don't know. No, I don't remember. Didn't know at the time just what was intended, except I assumed that this was the pump complete. I haven't any drawings of the pump of course at this time. That simply gave the details of what he proposed to furnish and I didn't attempt to analyze it.

(Answer of witness read.)

Q. Did you have any understanding at the time of what "casing for vertical discharge" meant, as

(Deposition of Daniel W. Mead.)

mentioned in this letter? If so, state.

Mr. LYON.—That is objected to as leading and suggestive, incompetent, not the best evidence, no foundation laid for the introduction of secondary evidence.

A. There had been no understanding at this time concerning any of the details.

Q. Did anything further transpire in this matter that we are discussing, to your knowledge?

A. Mr. Jackson's proposition as given in his letter of April 8th, 1903, was not complete, and Mr. Pabst desired to know what the date of delivery would be, and I wired Mr. Jackson on April 14th, 1903, asking for the date of delivery and received a wire from him stating the date that he would guarantee to deliver. [85]

Q. Have you any record of these wires?

A. Copies of both wires are in my files.

(Witness produces what purport to be copies of wires on Western Union Telegraph Company blanks, both dated April 14th, 1903, one signed by Daniel W. Mead and the other by Byron Jackson Machine Works.)

Q. As to the one signed Byron Jackson Machine Works, when did you receive same?

A. That was received on the same date, April 14th, I think. It might possibly have been received the next morning. I am not positive in regard to that.

Q. Where has this telegram been since you received it?

A. They have both been in my files.

(Deposition of Daniel W. Mead.)

Q. And this other one, signed by Daniel W. Mead, how was that transmitted, how was the telegram transmitted?

A. Well, it was transmitted by Western Union.

Q. When? A. On April 14th, 1903.

Q. By whom?

A. By myself. That is, it was written by myself.

It is stipulated these two wires may be received in evidence and copied into the record as Defendants' Exhibit "M-13" and "M-14," respectively, the first being with respect to the wire sent by Daniel W. Mead and being as follows:

**Defendants' Exhibit "M-13."**

April 14th, 1903.

To Byron Jackson Machine Works,  
San Francisco, Cal.

What date of delivery will you make on Pabst pump?

DANIEL W. MEAD. [86]

**Defendants' Exhibit "M-14."**

April 14th, 1903.

San Francisco, Cal.

To Daniel W. Mead.

Would like sixty days time for Pabst pump see letter.

BYRON JACKSON MACHINE WORKS.

Q. What, if anything, further transpired in this matter and next in order?

A. The next that transpired was a dispatch from me to Jackson offering him \$2,500 to furnish the

(Deposition of Daniel W. Mead.)

pump and erect it and operate it for ninety days. That is to say, they offered \$2,500 for the pump delivered in sixty days if operated for ninety days successfully.

Q. And when did you make that offer?

Mr. LYON.—What is the date of the telegram?

A. April 16th, 1903.

Q. Can you produce any record showing that?

Witness produces copy of telegram dated April 16th, 1903.

Q. Has this been in your files since that time?

A. It has.

Mr. LYON.—Let the record correctly show the fact that the witness is handed a copy of a telegram dated April 16th, 1903, which has been marked Exhibit "M-15," and which is as follows:

**Defendants' Exhibit "M-15."**

April 16th, 1903.

To Byron Jackson Machine Works,  
San Francisco, Cal.

Pabst accepts sixty days shipment pump complete [87] installed by your representative twenty-five hundred subject to ninety days successful operation.

DANIEL W. MEAD.

Q. I notice that this telegram, Mr. Witness, refers to the acceptance by Pabst of a shipment of pumps at \$2,500. You have referred to a wire offering that amount. Have you such a copy in your file?

A. No; the original letter of Jackson's, I believe, did not contain a price, or if it did, it was ignored,

(Deposition of Daniel W. Mead.)

and Mr. Pabst offered him \$2,500 for that pump in this telegram, to be delivered in sixty days, to be erected by Jackson, and to operate successfully for ninety days. This was a counter offer on my part for the Pabst Brewing Company, and contains matter outside of the—well, now, the trouble is, here is a lot of stuff that is in two or three places. Here is one on April 15th, in which a direct offer is made, and that was separated from the other because of this photostat process, so that's the reason I didn't find it. That's (indicating) the one on the 15th.

Q. This was sent to you on that date?

A. It was.

Q. And this copy has been where since?

A. In my files.

It is stipulated that this copy of telegram dated April 15th, 1903, may be received in evidence and copied into the record as Defendants' "M-16" as follows:

**Defendants' Exhibit "M-16."**

April 15th, 1903.

To Byron Jackson Machine Works,  
San Francisco, Cal. [88]

Pabst offers twenty-five hundred pump shipped within thirty days erected and operated successfully for ninety days by your representative.

DANIEL W. MEAD.

Q. Did anything further transpire in this matter that you know of? If so, please state.

Q. Just after these last telegrams I received a letter from Jackson dated April 14th, 1903, in re-

(Deposition of Daniel W. Mead.)

gard to the general proposition of this deep well pump. The original copy of this was, in accordance with my best recollection, sent to Pabst, and all I have is a copy of the original, which I had made before sending the original away.

Q. Then this is a copy of a letter you received from Mr. Jackson, is it?

A. Yes. I don't think there is anything in there that is of interest to you, but that explains some things in regard to Mr. Jackson's first pump.

Q. When did you receive the letter of which this is a copy?

A. It was received probably somewhere about the 18th; several days, three or four days after its date there.

A. And where has this copy been since you received the original?

A. The copy has been in my files.

It is stipulated that this letter from Byron Jackson dated April 14th, 1903, marked Defendants' Exhibit "M-17," may be received in evidence and copied into the record as follows: [89]

**Defendants' Exhibit "M-17."**

**COPY.**

San Francisco, Cal., Apr. 14, 1903.

Mr. D. W. Mead,

Chicago, Ill.

Dear Sir:

Referring to our telegram of today, and our letter by Mr. Boyer, Apr. 8th, regarding deep well centrifugal pump for Pabst Brewery, Milwaukee.



I think it is to our mutual interest for me to write a letter of explanation why your original question was not more promptly answered, and the reason for the paragraph at the end of Mr. Boyer's letter, dictated by myself.

As you know, I have already given this problem some thought and have made some sketches and have actually made one pump for a 10" well, which we pump some 400 G. P. M.; but with a low efficiency (if I remember right) about 33 to 40%. This pump was made with propeller veins rather than centrifugal pump veins, and while this test was not a very thorough one, it was quite sufficient to convince me that the propeller vein was not the proper form for any pump, except something of a very low lift and special circumstances. My study of this problem was quite sufficient to convince me beyond a doubt that your friend Edw. C. Hart & Co., 59 Dearborn St., Chicago, who published the pamphlet entitled the "Multiple Pumping Machinery & Turbines" is entirely theoretical, and the chances are that he has never made or tested, not even one, centrifugal pump. The only effect that it had on me was to excite my curiosity and to wonder what he expected to make out of such publication.

Now, the above remarks are intended to explain in a measure why I delayed writing, and because I desired to take the necessary time to make a better plan than anything I have made [90] up to date, and submit it to you with the bid that would look at least reasonable from my standpoint, that is, something I would be willing to offer and recom-

mend, but the facts were that our Mr. Vandegrift, who makes our pump drawings, was in the country on a vacation, and so I had no one who was drilled in this line, to work out my ideas; but I hope to take the time to do it myself, because I believe that it is the only way I will succeed in getting what I think might do the work, because it certainly is an unusual problem to make a revolving shaft 200 ft. long and suspended in a well and balance it with hydraulic pressure, and pump 600 to 1000 G. P. M. out of a well only 15" in diameter.

One item which is a hard one to solve is the fact that there are no bored wells that are straight for 200 ft. They are not even approximately straight. Sometimes they curve several feet out of line. Then the oiling problem is a very important one, and then the practical method of coupling the sections together, with satisfactory arrangements for taking the pump out of the well again for inspection and repairs, which must inevitably take place sometime.

I have full faith, however, that this problem can be worked out, and I have long since been intending to undertake it when I had the leisure time, but for the past few years, since I made the first deep well pump, I have had all I could do in our special line, and so have not done anything further with the experiment than to occasionally make and file some sketches when we got to talking and thinking about it. But your second letter urging us to take some action,—Mr. Boyer took up the matter and made an estimate, and then after he wrote the letter and estimate, I saw fit to add the last paragraph. It seems to [91] be a very indefinite proposition,

(Deposition of Daniel W. Mead.)

yet it is a proposition whereby your client takes no risk except to wait until we produce something or other that suits him, which if we had a prospective order contingent on the drawings and the pump after test being satisfactory, it would probably spur us up to take immediate action, which if we would push the matter, we could at least make a design and build a pump in the 60 days, but we could not insure success until after it had been attained.

So if your client feels like placing an order, please state the lowest limit of efficiency and the conditions under which he will accept it, if we can meet the conditions, stating the highest number of revolutions they would think practical for a rope drive. You are undoubtedly aware that it is pretty hard to get pulleys small enough to work up a high speed with rope transmission, and I would think an ordinary good flat belt would be better, because I think it would be necessary to adopt pretty high speeds, 1200 or 1500 revolutions at least.

It is true that there is a great demand for a pump of this character, and I am willing to spend a little money in trying to develop it, but it would not be good business on my part to make a guarantee for a year so far away from home, unless we had ample time to succeed or give it up before shipment.

Yours truly,

BYRON JACKSON MACHINE WORKS,

Per BYRON JACKSON. [92]

Q. What, if anything, further transpired in this matter, next in order?

A. On April 18th, I received a wire from Mr.

(Deposition of Daniel W. Mead.)

Jackson stating that he would mail the contract and commence work on the Pabst pump Monday, the same as if it was signed. A copy of that I have in my files.

(Copy of telegram produced by the witness.)

Q. And did you receive this wire in the usual course of telegraph? A. I did.

Q. And where has this telegram been since that time? A. Been in my files.

It is stipulated that this wire from Byron Jackson dated April 18th, 1903, marked Defendants' Exhibit "M-18," may be received in evidence and copied into the record as follows:

**Defendants' Exhibit "M-18."**

**COPY.**

San Francisco, Cal., Apl. 18-03.

Daniel W. Mead,

1st National Bank Bldg., Chicago.

Will mail contract and commence work Pabst pump Monday the same as if signed.

**BYRON JACKSON MACHINE WORKS.**

Q. What next transpired in regard to this matter?

A. I think perhaps I have omitted one dispatch which perhaps is necessary to give a full history of this Pabst pump, namely, one received from Jackson on April 15th, 1903, which seems to have been out of order, in which he stated that the price offered was satisfactory. [93]

Q. You received it on that day?

A. Yes, sir.

(Deposition of Daniel W. Mead.)

Q. Where has it been since then?

A. In my files.

It is stipulated that this wire from Byron Jackson dated April 15th, 1903, marked Defendants' Exhibit "M-19," may be received in evidence and copied into the record as follows:

**Defendants' Exhibit "M-19."**

San Francisco, Cal., Apl. 15, 1903.

To D. W. Mead,

605 First National Bank Building.

Price satisfactory but must have sixty days to succeed or abandon before shipment. See letter mailed.

**BYRON JACKSON MACHINE COMPANY.**

Q. What transpired next in order?

A. On April 16th I wrote Mr. Jackson reciting the fact that I had sent him a wire, and a few days later I received a letter dated April 13th, in which he acknowledges certain wires and discusses this Pabst pump. That letter from Mr. Jackson was undoubtedly forwarded to the Pabst people, and I simply kept a typewritten copy in my files. These two letters that I referred to were given here.

Q. They have been in your files since that?

A. They have been in my files since that time.

It is stipulated that the letter from D. W. Mead dated April 16th, marked Defendants' Exhibit "M-20," and letter from Byron Jackson dated April 15th, marked Defendants' Exhibit "M-21," may be [94] received in evidence and copied into the record as follows:

**Defendants' Exhibit "M-20."**

April 16th, 1903.

Byron Jackson Machine Works,

San Francisco, Cal.

Gentlemen:

Have just wired you as follows: "Pabst accepts sixty day shipment. Pump complete installed by your representative, twenty-five hundred, subject to ninety days successful operation," which I now confirm, and by which I place order for Pabst Brewing Company of Milwaukee, Wis. for a Series Centrifugal Deep Well Pump, in accordance with your favor of March 6th, with the following modifications, that you are to send this pump to Milwaukee and erect it in the well described in my letter of March 18th, and connect the same with a motor or engine, which will be supplied by the Pabst Brewing Company, together with belt or rope drive as may be later mutually agreed; that said pump shall operate successfully for a period of ninety days from the time it is placed in running order by your representative and connected to the motor above mentioned; that by successful operation is meant that the pump shall deliver at least 700 gallons of water per minute, provided the well will furnish that amount of water without drawing the head down below 220 ft. below the surface, and that the pump shall operate at that capacity at an efficiency of not less than 50%, and will require a motor not larger than the size to be specified by you.

You will please advise us as early as possible as to the proposed speed of this pump, and the type

of connection [95] you would recommend to the motor, and the size of the motor you will require.

Yours very truly.

**Defendants' Exhibit "M-21."**

**COPY.**

San Francisco, Cal., Apr. 15, 1903.

Mr. Dan W. Mead,  
Chicago, Ill.

Dear Mr. Mead:

I have just written the enclosed already mailed letter before receiving your telegram reading as follows:

"Pabst offers twenty-five Hundred pump shipped within thirty days erected and operated successfully for ninety days by your representative."

to which I have just replied by wire as follows:

"Price satisfactory but must have sixty days to succeed or abandon before shipment. See letter mailed."

You will readily understand that we can make this experiment here without much loss, provided that we fail to succeed, while if we shipped the plant and installed it before making the experiment, or having a chance to abandon the order, we necessarily are out the cost of the vertical shaft and freight and the man's time, that can be avoided by testing the pump in the Works, when we can be reasonably sure of the complete success.

I have, in my time, taken orders where we required an unlimited time to keep trying until I either succeeded or gave up the job, but in this case,

I am perfectly willing to limit the time to 60 days.

I want to say that we have recently installed a testing plant in the Works, where we have an engine and dynamometer, [96] pulley and every convenience for measuring the power required. We have demonstrated over and over again that the heads measured by correct pressure and vacuum gauges, gives the same results as pumping against an actual head, and we can with but very little expense measure the end thrust on the pump shaft so as to determine whether it will approximately carry the load of shafting and couplings. I do not think, however, that it would be possible to make a complete balance of the shafting but it would be approximate enough so that good ball bearing thrust collars will carry the end thrust of shaft either up or down. Further, I think I have a method of oiling these bearings that will insure oiling and reasonable durability.

So I repeat that I am anxious to accept the order with the condition that we can have 60 days time before shipping the plant, with the privilege of abandoning the order, if we find we are not successful, giving your client the option of extending the time if we needed it or not.

I do not think it would be practical to make all the pipe fittings there, still we would undoubtedly make a portion of them there in order to save freight, as you know that if we buy the pipe in this market, we have to pay freight both ways, so if we were successful in the pump it is quite possible that we could have the pipe and shafting fitted up there according to your drawings, under a contract which



(Deposition of Daniel W. Mead.)

you could supervise for us.

Hoping that something may come of this correspondence, I am,

Yours very truly,

BYRON JACKSON MACHINE WORKS.

Per BYRON JACKSON. [97]

Q. What, if anything, next transpired, Mr. Mead?

A. My recollection is that Mr. Jackson submitted a contract, which was duly forwarded to the Pabst Brewing Company, and which was not satisfactory to the Pabst Brewing Company. I have, however, no copy of that contract.

Q. Was that contract submitted through you?

A. My recollection is that it was. In fact, I think practically all of the correspondence between Jackson and Pabst was through my office. I don't think they wrote direct about anything. I know that Jackson wired me that he was going to send a contract, and my recollection is he did send a contract, and that I forwarded them, they were to be in triplicate, and that the triplicates were forwarded to Pabst, and Pabst was not satisfied with it, and returned his proposed contract for the same thing, which is dated April 20th, 1903, and I believe a photostat has been made of it.

Mr. LYON.—We object to the statement of the witness as to the alleged date of this contract, on the ground that it is incompetent, not the best evidence, and no foundation laid for the introduction of secondary evidence, and move to strike that from the record and exclude it from consideration upon each of these grounds.

Q. What do you now produce?

(Deposition of Daniel W. Mead.)

A. The form of contract offered the Byron Jackson Company by the Pabst Brewing company and signed by the Pabst Brewing company—not by Jackson.

Mr. LYON.—Is this one of the originals that you had at that time?

A. This is one of the originals. [98]

Q. And it came to you from whom?

A. From the Pabst Brewing Company.

Q. How was it received? A. Received by mail.

Q. And this signature on the fourth sheet, "Pabst Brewing Company, by G. G. Pabst, Vice-president," do you know that signature?

A. I do. I have a number of letters from Mr. Pabst.

Q. And that was the signature of the then vice-president of the Pabst company? A. It was.

Q. This was received by you on the date given on it at the head of it?

A. Well, about that date. Probably a day later.

Q. And where has this triplicate copy of contract just produced by you been since that time?

A. It has been in my possession; in my files.

Mr. LYON.—Q. I notice, Mr. Mead, that this contract contains a rubber stamp, "Pabst Brewing Company, by ———, Vice-president," and the signature "G. G. Pabst." At the top there is the date April 20th, 1903, although the body of the contract does not seem to bear a date. Now, do you know of your own knowledge that no contract was entered into prior to April 20th, 1903, between Byron Jackson and the Pabst Brewing Company in

(Deposition of Daniel W. Mead.)

regard to this pump installation that you have been talking about?

A. Why, I think I can say yes, because all of those things passed through my hands, they had no communication with each other, and I know that a contract was not signed until considerably later than this. [99]

Q. Then you are certain that it was not until considerably later than April 20th, 1903, that the contract was actually signed by both of the parties?

A. Yes.

It is stipulated that the contract last identified by the witness, marked Defendants' Exhibit 22, may be received in evidence and copied into the record as follows: [100]

**Defendants' Exhibit "M-22."**

April 20, 1903.

Triplicate.

AGREEMENT between BYRON JACKSON of San Francisco, party of the first part and the PABST BREWING COMPANY of Milwaukee, Wisconsin, party of the second part.

WHEREAS there has been correspondence between the parties hereto by letters and telegrams, the following is intended to embody the terms of an agreement, for the manufacture and delivery of a deep well Centrifugal pump, to be driven by steam engine, with either rope drive or flat belt, as shall be determined hereafter, after working drawings of the pump are completed.

WELL:—Is guaranteed by the party of the sec-

ond part to be about 15" internal diameter at any point in its full depth, thus permitting a series Centrifugal pump, made not more than 14 in. outside diameter to pass freely through well casing. That one inch (1 inch) clearance between the outside diameter of pump and casing will be sufficient to provide for any imperfections of uneven diameter in the well casing. Also that the well shall be approximately straight, permitting a 10" casing pipe with screwed couplings to pass through its full length of 200 feet practically straight.

**PUMP:**—To be of the Centrifugal Series type four (4) or more steps, having a capacity of 700 gallons per minute; Revolutions not to exceed 1500 per minute. The pump shaft to be encased in a pipe within the discharge pipe. Bearings approximately every ten (10) feet and suitable means provided for oiling same which will allow no mixture of the oil and water. Total length from bottom of suction to discharge at top of well, 200 feet. [101] The pump to be suspended in the well by the discharge pipe.

**HORSE-POWER:**—The net water horse-power is estimated at 40; the H-P to drive pump at the first coupling joining shaft of the pump, not to exceed 80 H-P. Horse-power required to drive the 200 ft. vertical shaft not to exceed 8 H-P.

The party of the first part agrees to undertake the designing and manufacture of the above pump, including discharge pipes, pulley and shafting complete and deliver same at Milwaukee and install it in the well at the Pabst Brewing Company's Works, on foundations to be supplied by the said Pabst

Brewing Company. A suitable derrick is also to be supplied by the said Pabst Brewing Company and placed over the well of sufficient height to raise each section of pump and pipe in place one above the other, each section not to exceed 20 ft., requiring the top pulley of derrick to be approximately 40 ft. high.

**TEST:**—It is agreed by the parties to this contract that the pump shall be tested at the works of the party of the first part in San Francisco by a dynamometer pulley, measuring the power. The capacity of the pump shall be measured by a weir and if the test shows the capacity to be 700 gallons, under gauge pressure of 95 pounds, total suction and discharge pressure, measured by correct gauges placed on the pump, and the vertical end thrust of the shaft upwards is approximately equal to the weight of the proposed driving shaft, and the pump is otherwise apparently satisfactory to the Contractor, he agrees to ship it to Milwaukee within sixty (60) days from above date, but if not satisfactory to the Contractor and he does not believe that it would run ninety (90) days successfully and to the satisfaction of the party of the second part, he has the option of abandoning [102] this contract.

**TIME OF DELIVERY:**—The party of the first part agrees to proceed at once and use due diligence to make the plans and construct the pump as specified and ship same on or before sixty (60) days from the above date. He will also submit the plans to D. W. Mead, the consulting engineer, as well as the said Pabst Brewing Company as soon as made and will make either rope drive or belt pulley as

may be selected by the party of the second part. It is understood and agreed by the parties to this contract that the party of the second part is to furnish the belt and power for operating the pump during the ninety (90) days successful run.

**PAYMENT:**—The party of the second part agrees to pay for the above pump as specified Twenty-five Hundred Dollars (\$2500.00) at the expiration of ninety (90) days successful operation.

**GUARANTEE:**—The party of the first part guarantees the pump as specified and to have a capacity of 700 G. P. M. and require no more than 88 h. p. delivered at the pulley or 80 h. p. delivered at the first shaft coupling at the pump, and the shaft bearings and couplings, pipe and pump will be made of the best material and workmanship for the purpose: that when pumping from 400 to 700 G. P. M. at 200 foot head, the shaft will be partially and approximately balanced by the discharge pressure of water acting on the pump runners and the unbalanced end thrust of shafting either up or down will be held in place by a suitable end thrust bearing. And the parties of the second part agree to guarantee the party of the first part against loss caused by the well casing being less than about 15" diameter or any other cause preventing the free passage of the pumps and pipes into the [103] well, and will accept the plant as specified and pay the contract price when it has operated successfully ninety (90) days with reasonable wear and tear, unless it shall be satisfactorily demonstrated by said party of the first part that failure in this respect shall have been caused by failure of supply of water in

(Deposition of Daniel W. Mead.)

the well. The party of the first part furthermore promises and agrees to indemnify and protect the party of the second part against all loss, cost or damage by reason of all patent infringement suits relating to said pump, and agrees to assume in their behalf the defense of all such litigation as may be instituted against said second party on account of alleged infringements of patents.

The parties hereto subscribe their names and executed in duplicate.

PABST BREWING COMPANY.

By G. G. PABST,

Vice-prest. [104]

Mr. BLAKESLEE.—Q. What next transpired in this matter, if you know?

A. The next that my records show is a letter from Mr. Jackson dated May 5th, 1903, inquiring about the delay in furnishing certain information. This delay was a matter of the delay of the Pabst Company, and the original copy was sent to the Pabst Company.

This (indicating) was in regard to a dummy that was to be let down the well, and letting the dummy down the well was to be done by the Pabst company. I sent this copy to the Pabst company and they advised me in regard to the effect, and I answered this letter by wire on May 18th that the "Fourteen inch dummy goes down two hundred feet. Contract mailed."

Mr. LYON.—That's a wire?

A. That was a wire. I find here under date of May 14th that I wrote Mr. Jackson concerning this

(Deposition of Daniel W. Mead.)

matter before that telegram. This comes in really before the telegram. That was written in my own handwriting with a piece of carbon paper, and that's a carbon copy. Those two together constitute the answer to that letter.

Q. This copy of letter by you of May 14th, 1903, has been in your files since you sent it?

A. It has.

Q. You sent it in the usual course of mail?

A. I did.

Mr. BLAKESLEE.—I now refer to Defendants' Exhibit "M-25."

Q. This copy of letter of May 5th, 1903, received by you from Byron Jackson Machine Works, the original thereof was received in due course of mail?

A. It was. [105]

Q. And where has this been kept since you received that? A. In my file.

Mr. BLAKESLEE.—Reference is had to Defendants' Exhibit "M-23" in the preceding question.

Q. I now refer to Defendant's Exhibit "M-24." When did you send this telegram?

A. On May 18th, 1903.

Q. Where has this copy been since that?

A. In my files.

It is stipulated that the letter from Byron Jackson Machine Works, dated May 5th, 1903, marked Defendants' Exhibit "M-23"; a telegram from Daniel W. Mead, dated May 18th, 1903, and Def. Ex. "M-24," a letter from Daniel W. Mead, dated May 14th, marked Defendants' Exhibit "M-25," may be



received in evidence and copied into the record as follows:

**Defendants' Exhibit "M-23."**

San Francisco, Cal., May 5, 1903.

Mr. D. W. Mead,

1st National Bank Bldg.,

Chicago, Ill.

Dear Sir:

Regarding the Pabst Brewery contract, I am a little surprised that I have not heard about it, as it is quite important that I should know the largest diameter of pump that will pass down through the 15" well. As I wrote you before, I had made the sketch 14-1/2" diameter, but thought that the imperfections of the well casing might prevent its freely passing down the well, and so have arranged drawing now to 14" diameter. I have also [106] designed a system of oiling the pump bearings by means of a single quarter inch oil pipe to pass down through the inner pipe which encases the shafting and connected to the pump and to the bearing by a system of drill holes in the castings, which I believe will be a successful method of oiling.

It is true it cannot be adjusted as nicely as the Rockford arrangement, because it must remain as it is made before putting it in the well, but notwithstanding that the pressure will be different in each of the series of bearings in the pump, the total pressure of the head above will be in excess of the highest pressure because of the location of the holes in the pump. I believe it will be a successful method of oiling and may be used either with a light

soft grease or with a light liquid oil, but on the whole, I am pleased with the design and shall make it and test it as soon as possible, but I hope to get the information regarding the net diameter of the well in time to change the diameter of the pump if necessary, but I think it important to have it the largest possible to go in the well.

Yours truly,

BYRON JACKSON MACHINE WORKS.

Per BYRON JACKSON.

**Defendants' Exhibit "M-24."**

May 18th, 1903.

Byron Jackson Machine Works,

411 Market St.,

San Francisco, Cal.

Fourteen inch dummy goes down two hundred feet.

Contract mailed.

DANIEL W. MEAD. [107]

**Defendants' Exhibit "M-25."**

Danville, Ill. 5-14-03.

Byron Jackson Machine Co.,

San Francisco, Cal.

Gentlemen:

I wired you to-day concerning size of Pabst's well and I am sending you herewith a blue print showing how the well was tested, also a letter from Grey Brothers which tells of the test. Please return letter after reading same. Mr. Pabst advises us he will have a test made with a dummy pump as you suggested. This will take several days and

(Deposition of Daniel W. Mead.)

I will wire you the results as soon as obtained.

Very truly,  
DANIEL W. MEAD.

Pabst will write you direct with contract.

Q. Have you a letter dated April 29th?

A. I have no letter of April 29th that I find, except one of the Geneva pump. That mentions the Pabst Brewing company's pump in that letter, however, and is quite likely the one to which you refer.

Mr. LYON.—That letter of April 29th, 1903, was part of the correspondence between Byron Jackson and yourself at this time, wasn't it? A. Yes.

Q. Then let us have that in this connection.

A. It says: "Subject: Additional Remarks on the Geneva Pump," and does contain some remarks in regard to the Pabst Brewing Company's pump.  
[108]

(The letter last referred to and identified by the witness was marked for identification Defendants' Exhibit "M-26.")

It is stipulated that the letter from Byron Jackson Machine Works under date of April 29th, 1903, marked Defendants' Exhibit "M-26," may be received in evidence and copied into the record as follows:

**Defendants' Exhibit "M-26."**

San Francisco, Cal., Apr. 29, 1903.

Mr. D. W. Mead,

Chicago, Ill.

Dear Sir:

Subject: Additional Remarks on the Geneva Pump:—

I note that Mr. E. C. Hart Co. are willing to make the Geneva pump and install it complete for \$750.00. Of course I could not compete with them if they propose to make it at cost as they may estimate that ordinary standard pipe and fittings can be used in such jobs. While I do not think so, I am satisfied that the couplings for the pipe must be selected and specially threaded and demonstrated to be perfectly straight; the same applies to the inside pipe that I propose to make, while I note from his pamphlet that he proposes to let his shaft run in the water. Further I note that his pulley stand seems to me to be rather a frail design. Further he may have his designs and patterns already made and does not count them in the cost of manufacture. Further he may be more anxious than I am for an opportunity to experiment, while I am not very anxious for a contract for just for the glory that is in it. I am getting old enough now that I like to see [109] a little profit in each transaction. And further, I find that where we make guarantees of efficiency and durability that we must have something more than the cost of the plant in order to make a living and so for these reasons I think that the prices that I name are about right. It is true that this design of a pump does not take very much material or work after it is once developed, but at present no such pump has been developed, and I want to get a price that will help to pay for developing, and now that I have the order for the Pabst Brewing Co., I propose to make this pump and test it anyway, whether it is ever shipped and installed or not, and I am not going to wait even

(Deposition of Daniel W. Mead.)

for the answers to the questions in the letter submitted herewith, but will expect an answer at the earliest possible.

Hoping to get your advice and other information asked for as soon as possible, I am,

Yours truly,

BYRON JACKSON MACHINE WORKS.

Per BYRON JACKSON.

BJ/PL.

Mr. BLAKESLEE.—Q. Then you don't find any other letter of April 29th, 1903?

A. No, I don't. I don't believe I ever had such a letter. That is, I don't find it anywhere here.

Q. Any further correspondence following this matter?

A. Yes. I have two letters from Byron Jackson, one dated May 20th, 1903, and one dated May 23d, 1903, in regard to the Pabst pump and the contract therefor. The one of May 23d contained a copy of a letter of similar date, which Mr. Jackson sent me, and stated that it was the copy of a letter he had just written [110] the Pabst Brewing Company. This copy is a letter-press copy and is dated the same date, May 23d, 1903.

Mr. LYON.—The letter-press copy that you have just referred to is the one that was enclosed in this letter of May 23d? A. Yes.

Witness produces a letter dated May 20th, 1903, signed "Per Byron Jackson."

Q. And when did you receive this letter?

A. Well, some time after May 20th, 1903.

Q. And in the usual course of mails?

(Deposition of Daniel W. Mead.)

A. Yes.

Q. Where has it been since?

A. Been in my files ever since.

It is stipulated that the letter above referred to, from Byron Jackson Machine Works under date of May 20th, 1903, marked Defendants' Exhibit "M-27," may be received in evidence and copied into the record as follows:

**Defendants' Exhibit "M-27."**

San Francisco, Cal., May 20, 1903.

Mr. D. W. Mead,

1st National Bank Bldg.,

Chicago, Ill.

Dear Sir:

We are in receipt of yours of May 14th regarding the Pabst well. I received the blue print which has the largest ring only 13½" diameter and even if it was the right diameter, I would not consider it a safe guarantee that the pump itself would go in the well because the rings are further *pa* apart [111] and might pass around an obstacle that the pump would not. But I have also received your wire dated May 18th reading "14" pump goes down 200 ft. contract mailed." This I consider definite and will make the pump 14" diameter which is the size I am making the patterns, but had suspended the work since May 14th because of the uncertainty and we had arrived at a place where we must be definite. Our Mr. Vandegrift is back now and we will push the work to a finish and hope to have it

(Deposition of Daniel W. Mead.)

tested, enabling us to ship it on time if it does the work satisfactorily when tested.

Yours very truly,

BYRON JACKSON MACHINE WORKS.

Per BYRON JACKSON.

BJ/JAC.

P. S.—Enclosed return W. A. Gray's letter.

Witness also produces a letters signed "Per Boyer," dated May 23d, 1903.

Q. When did you receive this letter?

A. A few days after May 23d, 1903.

Q. Received it in due course of mails?

A. In due courses of mails.

Q. Do you know this signature of Mr. Boyer?

A. I do.

It is stipulated that the letter signed "Per Boyer" under date of May 23, 1903, marked Defendants' Exhibit "M-28," may be received in evidence and copied into the record as follows:

**Defendants' Exhibit "M-28."**

San Francisco, Cal., May 23, 1903.

Mr. Daniel W. Mead,

Chicago, Ill. [112]

Dear Sir:

Enclosed I hand you copy of letter I am writing the Pabst Brewing Company and regret very much that the company thought it necessary to make these changes in my contract.

The first of course you will note is impossible. The second I really do not know how I would go about it to demonstrate it to them that the water

was not in the well should they see fit to doubt it, and further, if I could, there is not money enough in it to justify me to do any developing work. This matter of proving the capacity of wells is the most expensive trouble that I have in our business, and even under favorable circumstances I have had much contention to demonstrate that the water was not in the well, because,—that as soon as the centrifugal pump lets go, caused by the water receding frequently it will not pick it up again without stopping, but where there is considerable supply the water comes up so quickly, that there is no method of measuring except by pressure and vacuum gauges, and even then some will not believe it, especially if they want to turn the plant down and not pay for it. But in this particular case I would like to have you tell me how it could be demonstrated that the water was there if the pump started and show water for a short time and then let go? The pump is 200 ft. below the surface and there is only 21½" between the discharge pipe and the well casing and I confess I do not think of any way just now to measure how far the water recedes, and I would like to have you suggest some means of measuring the depth to which the water recedes. The third objection regarding to patent, I think my reasons are clear and should give no offense. I am anxious to do this work, but I think [113] the Pabst Co.'s contract shows that they propose to be very critical and will not lend their friendly assistance, but will say that it is up to me. They have not put a cent of money in it and therefore I am not as anxious as I would be if I felt that



(Deposition of Daniel W. Mead.)

they would give me friendly assistance and were anxious to get a good pump.

You readily understand that after I have made a few thousands of these pumps and know all about them, I might not be so timid, but at present I want to be convinced that the Pabst Co. are anxious and will give me friendly assistance, and will not expect me to develop their well.

Hoping that you will take time to consider this and give me your expert opinion about it, I am,

Yours truly,

BYRON JACKSON MACHINE WORKS.

Per BOYER.

BJ/PL.

Q. The letter-press copy of letter of May 23d, 1903, addressed to Pabst Brewing company and signed Byron Jackson Machine Works, per Byron Jackson, and enclosed in the letter of May 23d, 1903, from Jackson to Mead (Defendants' Exhibit "M-28"), is now copied on the record under the usual stipulation, marked Defendants' Exhibit "M-29," and is as follows: [114]

**Defendants' Exhibit "M-29."**

May 23, 1903.

Pabst Brewing Co.,  
Milwaukee, Wis.

Dear Sirs:

Beg to acknowledge receipt of yours of May 18th, returning a copy of the agreement I wrote up between us and substituting copies written up by yourself, I regret very much that I am unable to

subscribe to the changes you have made in it, but as I intend to complete the pump and test it, I am still willing to make an effort to make satisfactory contract, but if not, of course the pump will not be shipped even if the test comes out satisfactory. My reasons for not signing the contract as you have made it is as follows:

FIRST:—In your contract under heading of “Pump” in the line next to the last on first page, reading as follows:—“which will allow no mixture of the oil and water.” I think this is an impossibility to make such a design, besides my blue prints are very clear and show that the excess of oil after passing through all the bearings on the line shaft will discharge into the well and I specially mention this in some of my correspondence with Mr. Mead. This objection, however, is a common one and was made at Rockford and many other places where we put in city water works pumps, but after years of use, the amount of oil passing into the water has not proved a serious item; but if it is a serious item in your case, I do not know how to remedy it and for this reason, if no other, I would have to decline your contract.

SECOND:—In the guarantee clause on the last page commencing on the third line at “A” and ending at “B” written in [115] pencil, reading as follows:

“unless it shall be satisfactorily demonstrated by said party of the first part that failure in this respect shall have been caused by failure of supply of water in the well.”

Now the fact of failure of water supply in the well

may be self evident to me or any other expert on pumps and wells, but the purchaser may be very skeptical and hard to convince. The reason I say this, is because I have had a very large experience in this line, and have been required to spend large sums of money to demonstrate to the purchaser that the well did not have even water enough to supply a hand pump, when he had expected more than 1000 G. P. M., and the well was wet and had water standing in it and it was a very difficult task to convince him that the water was not there. While I not only believed it, but knew it and had positive knowledge about it. And for this reason, if you believe water is in the well, and I do not believe it, I shall require you to demonstrate that the water is there; why, because my pump will demonstrate the fact as well as any other.

I therefore decline to sign a contract where it devolves on me to develop the well, or to do any work at all that is caused by the want of supply of water.

If you can make any specifications how you will go about it to prove that the water is there when the pump that I install demonstrates that it has no water to pump, I should like to see the specifications, but I confess that I know of no way to demonstrate this, only by the fact that it don't pump water when I have tested the pump and found that by a certain number of revolutions it does pump the quantity of water measured by a weir and against the head measured by gauges. [116]

THIRD: In this same guarantee on the last page commencing at "B" and ending at "C," reading as follows:—

“The party of the first part furthermore promises and agrees to indemnify and protect the party of the second part against all loss, cost or damage by reason of all patent infringement suits relating to said pump, and agrees to assume in their behalf the defense of all such litigation as may be instituted against said second party on account of alleged infringements of patents.”

My reason for declining to sign this is FIRST,—I propose to apply for a patent for this pump as drawn and specified if it proves satisfactory, and when I do, I will then learn through the patent office whether there are any other patents which it infringes, and after obtaining such patent, I am willing to subscribe to such a clause, but at present I decline to do so, because I believe that a wealthy corporation like yours is more liable to be sued for infringement than I would be, and if so, the damages might be much greater than the royalties or cost of it. Besides I would have to defend suit away from home and other parties being vitally interested, I feel that the sum involved in this contract would not justify such an undertaking. As the law prevents the patentee to choose whether he shall take action against the user or the manufacturer or the vender, he is most likely to choose the one having the most money, where he thinks the damages will be greatest.

In conclusion I wish to say that I tried to make a contract that would be fair to both parties and at present I am willing to stand by that contract and I propose to complete the pump and test it in any

(Deposition of Daniel W. Mead.)

event and for this reason I return the contract as I made it up, hoping that it will be satisfactory, [117] but if you can make it more satisfactory to you and still satisfactory to me, there is time yet to try again.

I will send a copy of this letter to Mr. Mead, hoping that you and he may succeed in making a contract that we can both subscribe to.

Yours truly,

BYRON JACKSON MACHINE WORKS.

Per BYRON JACKSON,

Proprietor.

BJ/PL. [118]

Q. What next transpired in this matter?

A. Under date of June 9, 1903, Mr. Jackson wrote me on several matters, among which was the pump he was building for me for Ft. Worth, Texas; some comments concerning his return of the contract that the Pabst Brewing Company had had me forward, and some further comments on a pump he was to build for Geneva, Wisconsin. Now, that was the next in order.

Q. This letter was received by you, when?

A. Early in June, 1903, and it has been in my files ever since.

Q. And this is the signature of the same Byron Jackson? A. It is.

The letter last identified by the witness was marked for identification Defendants' Exhibit "M-30."

It is stipulated that the letter from the Byron Jackson Machine Works under date of June 9th,

1903, marked Defendants' Exhibit "M-30," may be received in evidence and copied into the record as follows:

**Defendants' Exhibit "M-30."**

San Francisco, Cal., June 9, 1903.

Mr. Daniel W. Mead,  
1st National Bank Bldg.,  
Chicago, Ill.

Dear Sir:

I beg to acknowledge receipt of yours of June 4th asking for further time on the Fort Worth pump, which is granted. While we need money and lots of it, like everyone in business, still we always expect to extend favors to our customers, when they [119] treat us right.

PABST BREWING CO.—As you probably know by this time I returned the contract that this company made out, because of the changes they made in it. I sent you a copy of the letter I wrote them and I have recently had a letter from them saying that they had taken the matter up with you and hoped to make a contract that would be satisfactory to me. I replied that I was not delaying the pumps, but would make them regardless of the contract, as I had faith that they would be alright when finished. I can see, now, however, that we are a little doubtful whether we will be on time, but near enough no doubt, if the parties are anxious.

I certainly was surprised that they should put in the contract that we would guarantee not to get any oil in the water, as that was impossible, besides I

(Deposition of Daniel W. Mead.)

do not think they should expect us to demonstrate that there was any water in the well unless they were satisfied to believe the action of the pump; As I would be confident that if the pump started and worked for a short time alright and stopped, it was undoubtedly caused by want of water.

GENEVA PUMP:—Is being made 11" diameter to make sure of clearance; Your telegram June 3rd, received. I have got the drawing complete for this pump and have started the pattern work but I am in doubt, however, of this being as efficient a pump as the larger diameter, as it is so small it cramps it and has to handle the water faster; But I have concluded to make it and take our chances on the test, which will be reported and I hope will turn out alright.

Yours very truly,

BYRON JACKSON MACHINE WORKS.

Per BYRON JACKSON.

BJ/JAC. [120]

Q. What next transpired in this matter?

A. Apparently in the latter part of June, 1903, I was in Detroit, Michigan, and wrote a letter to Mr. Jackson, a copy of which I have not on file, but discussed the Pabst pump, and I have a copy of the letter written by Mr. Jackson to me in answer to my letter of June 24th, his letter being dated June 30th, 1903, and the original having gone forward to the Pabst Brewing Company, and a copy which I had made remaining in my file.

Q. And what you produce is a copy?

(Deposition of Daniel W. Mead.)

A. That is the copy of the original letter of Jackson to me.

Q. And you received the original letter when?

A. Early in July.

Q. In the usual course of mails? A. Yes.

Q. And this copy has been in your files ever since? A. Ever since.

The letter last produced and identified by the witness was marked by the reporter for identification Defendants' Exhibit "M-31."

It is stipulated that the letter from the Byron Jackson Machine Works under date of June 30th, 1903, marked Defendants' Exhibit "M-31," may be received in evidence and copied into the record as follows: [121]

**Defendants' Exhibit "M-31."**

**COPY.**

San Francisco, Cal., June 30, 1903.

Mr. Daniel W. Mead,

Chicago, Ill.

Dear Sir:

I received yours dated Detroit, June 24th, and have also received a new contract from the Pabst Brewing Co. I note your method of measuring the static head in the well, and if there is room to pass the  $\frac{1}{4}$ " pipe by the pump and terminate exactly at the end of the suction, I see no reason why your method would not test the point at which the water receded in the well, but would measure the static head, but would not give us the advantage of the friction head, still this friction head I think could



be estimated satisfactorily to all parties.

**OIL IN WATER:**—This item is not satisfactory in the contract. It reads as follows:

“Bearings approximately every 10 ft., and suitable means provided for oiling same which will allow no undue mixture of the oil and water, which would make it unfit for the uses of the party of the second part.”

Now, I shall have to decline to sign this part of the contract, because the undue quantity will all depend on the amount of oil supplied to the oilers and the use for which the water may be intended, because I know of no method of retaining the oil in the bearings and all of the waste oil is there to pass into the water pumped. Theoretically, the oil that is wasted from the vertical shaft might float on top of the well water and thus accumulate in large quantities and never get into the pump unless the water was pulled down to the suction limit; but, practically, there may be sufficient water supplied from above the surface of water in well to carry all the oil down and into the suction of the pump as fast as pumped; but this fact can be understood as well by the Pabst people as by me or anyone else. They must take their own risk and it is not necessary that I should take it.

The pump is nearly finished, and will be tested as soon as finished, and a complete report made both to you and the Pabst Company, and if satisfactory to me when tested, I will cross out this clause regarding the oil in the contract and sign it, and if acceptable to the Company, will then complete the piping and shafting, and install the pump

(Deposition of Daniel W. Mead.)

as soon as possible. It is already past the 60 days, so I think it the proper thing to change the dates as it is impossible to deliver on time now that it is 10 days past the time it should be shipped, and it will probably be ten days yet before the pump is tested. I am pleased to state, however, that I think it looks all right.

I herewith enclose copy of this letter, that you may forward to the Company, with any suggestions you have to make.

I am pleased to hear a favorable report from the Fort Worth pumps and I expect they will make a good record, as we have [122] to beat the Rockford plant in making them, both in workmanship and efficiency.

Yours very truly,

BYRON JACKSON MACHINE WORKS.

Per BYRON JACKSON.

Mr. LYON.—Q. You have no way, Mr. Mead, of giving us the substance of your letter of June 24th, 1903, which you say you wrote from Detroit to the Byron Jackson Machine Works? A. No, sir.

Q. And to which this Exhibit "M-31" is a reply?

A. No, I have not. I have no copy of it.

Q. You haven't any recollection as to what was discussed in that letter except that it generally referred to the contract?

A. My recollection is it was simply a discussion of some of the disputed points in the contract between Pabst and Jackson, trying to get them together.

(Deposition of Daniel W. Mead.)

Mr. BLAKESLEE.—Q. What next transpired in this matter, Professor?

A. The next was a letter from Jackson.

Q. A wire?

A. A wire from Jackson, which I presume is in answer to a letter of mine asking the progress on the Pabst pump and the Geneva pump. Is it important that you have my letter asking him for this? I presume I have got it here scattered somewhere among these various files. I don't think the thing is of any importance whatever, but that's the next thing that I find in my file.

Mr. LYON.—If you happen to have it I would like to see it. I don't know that it need be offered.

Mr. BLAKESLEE.—If you want to, you can look that up between now and tomorrow some time.

Witness produced a telegram dated August 1st, 1903, marked for identification Defendants' Exhibit "M-32."

Q. When did you receive this?

A. August 1st. [123]

Q. And where has it been since?

A. It has been in my files.

It is stipulated that the wire from the Byron Jackson Machine Works under date of August 1, 1903, marked Defendants' Exhibit "M-32," may be received in evidence and copied into the record as follows:

(Deposition of Daniel W. Mead.)

**Defendants' Exhibit "M-32."**

San Francisco, Cal., Aug. 1, 1903.

To D. W. Mead,

1st National Bank Bldg.

Expect test Pabst pump first next week Geneva pump patterns ready for foundry will wire result of test

**BYRON JACKSON MACHINE WORKS.**

WITNESS.—I am unable to find the copy of letter to which this telegram of August 1st was a reply.

Q. What next transpired in this matter?

A. I next received a dispatch from Byron Jackson dated August 15, announcing a satisfactory test of the Pabst pump, together with, a few days later, a letter written on the same date, a copy only of which letter is in my file; the original was sent to Pabst for their information.

(Witness produces the wire just mentioned, marked for identification Defendants' Exhibit "M-33," and the copy of letter mentioned dated August 15th, marked for identification Defendants' Exhibit "M-34.")

Q. This wire of August 15th was received by you when?

A. About August 15th. On August 15th, I think. [124]

Q. And has been in your files since then?

A. It has.

Q. The original of this letter to you of August 15th, 1903, from Byron Jackson was received when?

(Deposition of Daniel W. Mead.)

A. Was received along about August 18th to 20th.

Q. And in due course of mail? A. Yes.

Q. And where has this copy of that letter been?

A. The copy has been in my files ever since.

It is stipulated that the wire from the Byron Jackson Machine Works under date of August 15th, 1903, marked Defendants' Exhibit "M-33," and the copy of letter from Byron Jackson, dated August 15th, 1903, marked Defendants' Exhibit "M-34," may be received in evidence and copied into the record as follows:

**Defendants' Exhibit "M-33."**

San Francisco, Cal., August 15th, 1903.

D. W. Meade,

214 S. Park Ave., Austin.

Preliminary test Pabst pump very satisfactory cannot complete test until Wednesday next.

BYRON JACKSON MACHINE WORKS.

**Defendants' Exhibit "M-34."**

(COPY.)

San Francisco, Cal., Aug. 15, 1903.

Mr. Daniel W. Mead,

Chicago, Ill.

Dear Sir:

I have just wired you as follows:—"Preliminary test [125] Pabst pump very satisfactory: cannot complete test until Wednesday next."

It is hardly necessary for me to write again my regrets because of the delay in getting this pump tested, but at the same time it seems only fair to

myself and you that I should make some explanation because the delay has not all been caused in making the pump, but has been delayed on account of the testing plant being occupied with other orders, and the plant itself being delayed because of the new dynamometer pulley having to be altered after trial, but we finally got the Pabst pump on the stand yesterday and made a short run at a half head and a corresponding speed and power showing very clearly that we will get a much better efficiency than 50%. As I was not present I will not attempt to give you the details, but I feel confident that we can fill the contract if we have not exceeded the time limit so far that the Pabst Company would decline to accept the pump.

It is my intention now to complete the test by Wednesday next and to write up a new contract fixing another time for delivery and completion of the plant.

If our final test is as satisfactory as we believe it will be the pump is ready for shipment with the exception of the pipe and shafting and the pulley, all of which I think can be made in Milwaukee, and save both time and freight, as our man could go there and superintend the fitting and the cutting of the pipe and shafting and probably have it all fitted up before the pump had arrived by freight. Please advise me by wire if the company will extend the time as suggested, and will accept the pump without the oiling and patent clause that they had inserted in my contract. [126]

I will state this much in detail regarding our test, that the efficiency is much better at a 1,000

(Deposition of Daniel W. Mead.)

gallons capacity than at 700, demonstrating that the pump has ample capacity if the well will supply the water, and I want the company to bear any expense necessary to prove that the well has the capacity because I shall not ship the pump unless I know that it will pump whatever the well supplies, and I shall put a clause in the contract to this effect because the price that I will receive for the plant installed will not justify me in undertaking to develop their wells, but at present I will say that I am very much enthused with the new deep well pump, and am quite confident that it is the coming pump for deep bored artesian wells.

Yours respectfully,

BYRON JACKSON.

Q. What is the next in order in this procedure?

A. On August 22d I answered Mr. Jackson's letter which I have just handed you, and I have a copy here in my files of my answer.

Q. This letter is dated August 22d, 1903. You sent it in the usual course of mails on that date?

A. I did.

Q. And this copy has been where since?

A. It has been in my files ever since.

Copy of letter last identified by the witness was marked for identification Defendants' Exhibit "M-35."

It is stipulated that the letter last referred to under date of August 22d, 1903, marked Defendants' Exhibit "M-35" may be received in evidence and copied into the record as follows: [127]

**Defendants' Exhibit "M-35."**

August 22d, 1903.

Byron Jackson Machine Works,  
San Francisco, Cal.

Gentlemen:

Replying to your favor of recent date concerning the pump for the Pabst Brewing Co. of Milwaukee, I wish to say that there is no doubt but what the pipe, shafting, pulleys, etc., can be furnished in Milwaukee and need not be shipped from San Francisco.

Mr. Pabst writes me as follows: "In regard to the oil, we think that Mr. Jackson ought to be able to make some sort of a guarantee after completing the test of the pump, and that he ought to be able to judge for himself whether the guarantees which he can give will do for our purpose. We agreed to drop the patent clause in the last contract, and we also specified a method for testing the well for water."

I would suggest that you make out a new form of contract, and include such guarantee concerning the question of oil as you are willing to make, and forward the same to the Pabst company.

In regard to measuring the water in the well, I would say that I have used the method I suggested, viz., by air pressure in a small pipe running down the well, in a great many cases, and that it can absolutely be relied on. I usually run the air pipe down several feet beyond the pump, and the exact position of the water can be told within a very small fraction, which, of course, depends on the accuracy of the gauge.



(Deposition of Daniel W. Mead.)

As there has already been considerable delay in the [128] matter of this pump I trust that you will give these matters your immediate attention.

Yours very truly.

Q. What next occurred in this matter?

A. The next I find is a letter from Byron Jackson dated September 5th, 1903, in which he inclosed a proposed contract and asked me to look it over. The contract as sent by Mr. Jackson was duly signed by him and was forwarded to Pabst. I retained, however, the original letter and copy of the contract that he inclosed with it, and hand you those two papers.

Q. This copy of contract you made yourself, did you?

A. It was made in my office. I didn't make it myself, no.

Q. And it has been in your files since?

A. It has.

Q. This letter of September 5th, 1903, was received by you when?

A. About September 8th, or thereabouts.

Q. And this is the signature of Byron Jackson to it? A. It is.

Q. This letter has been in your file since?

A. It has been in my file since.

The letter produced by the witness was marked for identification Defendants' Exhibit "M-36," and the inclosed contract so produced was marked for identification Defendants' Exhibit "M-37."

It is stipulated that the letter and contract above last referred to, marked Defendants' Exhibit "M-

36" and "M-37," respectively, may be received in evidence and copied into the record as follows:  
[129]

**Defendants' Exhibit "M-36."**

San Francisco, Sept. 5, 1903.

Mr. Daniel W. Mead,  
Chicago, Ill.

Dear Sir:

Enclosed I send you proposed contract for the Pabst Brewing Co., that you may inspect it and make any suggestions you think necessary before submitting it to the Pabst Brewing Co. You will note that I make no guarantee regarding oil injuring the water or making it in any way unsuitable for the use of the Pabst Brewing Co. I think this decision should be made by the Brewing Co., and the only thing that I can do is to specify the method of oiling and as I do not know how much oil mixed with the water would make it unsuitable for brewing purposes, the only thing I can know about it is that it is necessary that some oil should be supplied to make the bearings reasonably durable. The amount of oil used will depend somewhat on the attention given it, making the feeding constant and uniform and not intermittent.

If this matter is carefully attended to, using good oil, it is my opinion that the amount mixed with the water would be very limited, but whether it will injure the water in any sense, is a matter that I cannot undertake to decide and leave that for the Brewing Company.

**FILTERS.**—You can readily understand that oil is very easily filtered out of the water and the Company might adopt some simple method of extracting this oil from the water if necessary.

**OIL IN CITY WATER.**—You know more about this than I do, my experience being limited to 15 or twenty City and Village Waterworks. In every case that I have installed Centrifugal pumps that matter has been discussed and some people objected that the oil was injurious to the water, yet it is a fact that the quantity is such a homeopathic dose that I have never heard of [130] anyone being injured or refusing to use the water and personally do not believe that it is noticeable in use. But at the same time there may be instances where the oil would accumulate on top of the water and be seen and commented on. If the oil is detrimental it is barely possible that some kinds of oil may be less detrimental than others; for instance, sweet oil, cottonseed oil, or even castor oil, might be good for the health. But, laying all jokes aside, this matter must be decided now by the Pabst Brewing Co., and I shall insist on enough being used during the test of 90 days to protect the bearings from any undue wear.

**TEST.**—My test of the pump has been much of it devoted to investigating the necessary oiling, and I find the method I have adopted will only be sure to oil the top and bottom bearings. The intermediate bearings may not get oil except when the pump is idle because the water pressure in the bearings will exceed that in the oil pipe as you will note that all of the bearings connect with a common vertical

drill hole and this common vertical drill hole has a pressure about half that of the discharge pressure and this I apprehend will vary some as the bearings wear, thus making the durability of these bearings a question of experiment. Yet up to date none of our Series pumps have developed any undue wear in the center bearings. They only require attention and repairs after the end bearings have worn out. We have several two step pumps in City Water Works here in California that have been running about two years and I have heard no complaint, but always words of praise for them.

**EFFICIENCY.**—I herewith enclose a copy of some of the tests made. They are selected as representative of a great many tests that we have made and they show that the larger the quantity of [131] water the better the efficiency and you will note that we do not get much better efficiency than 50 per cent with the 700 gallons at the 200 ft. head and I think that these tests have demonstrated that with this special pump it would be better and more efficient to put in more than four steps, as is shown by the first test No. 1 and No. 2 in the table. No. 1 is intended to show the necessary speeds that five steps. No. 2 that six steps would use. No. 3 and 4 are the speeds necessary to do the work with four steps and No. 5 shows that the efficiency is improved when the quantity of water is increased and the head reduced, but at the same speed.

The above five tests were all made with a steam engine only and one bolt direct to pump. No. 6 was made to show the efficiency with a larger quantity of water and to see how near the engine

would check up with a dynamometer. No. 9 was made to see whether we could get any better efficiency if we put in six steps. No. 10 and 11 were made to see what the efficiency would be with a less quantity of water.

**GUARANTEE.**—You will note that in my guarantee I do not state it in efficiency. I simply guarantee the pump to pump 700 gallons if they supplied them, with 88 H-P delivered at the pulley and I think the tests show that if they have more water they will get a larger quantity without any addition in power. I also believe that in actual practice the efficiency will be better than shown in this test because we had to hold the end thrust with the thrust bearings; that undoubtedly consumed considerable power and is one reason why the efficiency shows better with the larger quantities and less head, while when the pump is vertical and pumping from a well the air is not so liable to interfere and the end thrust will be counterbalanced.

When the dynamometer pulley was used we were obliged to use two extra belts one of them crossed which interfered somewhat [132] with the accuracy of our test because of a tendency to slip and of course slipping always interferes with the efficiency shown.

**GENEVA PUMP.**—If they propose to install their own pump, why they can postpone the delivery any time to suit themselves, but if I am to install it I would like to do it while my man is over there, thus saving traveling expenses. We have got the patterns all complete and propose to make the pump anyway the same as we have done the Pabst pump

and test it. I think it is quite possible that we may improve on the next one, especially in efficiency. But even the efficiency as demonstrated I believe it will be practical and popular pump.

PATENTS.—You will note that I have designated this deep well as patented; that is because I have recently obtained a patent on our series pump that will apply to this pump, notwithstanding I propose to apply for other patents on it.

Yours very truly,

BYRON JACKSON MACHINE WORKS.

Per BYRON JACKSON.

BJ/JAC. [133]

**Defendants' Exhibit "M-37."**

Office of

BYRON JACKSON MACHINE WORKS,

411 Market Street,

San Francisco, Cal., September 5th, 1903.

AGREEMENT between BYRON JACKSON of San Francisco, party of the first part and the PABST BREWING COMPANY of Milwaukee, Wisconsin, party of the second part.

WHEREAS, there has been correspondence between the parties hereto by letters and telegrams and contracts proposed by both parties for the manufacture and installing of a deep well Centrifugal pump, but not entirely satisfactory to both parties. During this correspondence the party of the first part has designed and manufactured a Series type four (4) step deep well Centrifugal pump and tested it and is now ready to ship and install same for the party of the second part at his Brewery in Mil-

waukee, Wisconsin. The following is a new agreement and specifications intended to cover this correspondence and including the drawings of the pump as finally completed as follows:

WELL.—Is guaranteed by the party of the second part to be about 15" diameter at any point in its full depth, thus permitting a Series Centrifugal pump, made not more than 14 inches outside diameter, to pass freely through the well casing. That one inch in clearance between the outside diameter of pump and inside diameter of casing, will be sufficient to provide for any imperfections of uneven diameter in the well casing. Also that the well shall be approximately straight permitting the ten (10") inch casing pipe connected with screwed couplings and pump to pass through its full length of 200 feet practically straight. [134]

PUMP.—To be of the Jackson patent Centrifugal Series type, four (4) or more steps, having a capacity of seven hundred (700) gallons per minute; revolutions not to exceed 1,400 per minute. The pump shaft to be encased in a four (4) inch pipe within the discharge pipe. Bearings approximately every ten (10) feet, and forming the couplings for the joints of the pipes and provided for oiling same by means of sight drop oil feed into and through two (2) wrought iron pipes one-quarter ( $\frac{1}{4}$ ") inch diameter, leading from top of well to pump, and distributing the oil to the several bearings of the pump by means of drill holes in the pump castings. The vertical shaft bearings to be oiled by means of a sight feed into the top of the four (4") inch pipe that supports the shaft bearings, the oil passing

through each bearing to the one below it, and may finally pass into the well at the half inch drain-pipe when the water in well is pumped below it; all as shown in drawings herewith submitted and marked 1. E. 72, and 3. E. 22, and are made part of these specifications. The total length from bottom of suction to discharge will be (at top of well) two hundred (200) feet. The pump to be suspended in the well by the discharge pipe attached to the cast iron pulley frame and discharge elbow.

**HORSE-POWER.**—The net water horse-power is estimated at forty (40). The horse-power to drive pump at the first coupling joining vertical shaft to the pump not to exceed 80 H-P. Horse-power required to drive the 200 feet of vertical shaft not to exceed eight (8) H-P, equaling 88 horse-power delivered by the belt to the driven pulley at the vertical pump shaft.

**FOUNDATIONS.**—The party of the second part agrees to make at his own expense, suitable foundations at top of well to support the pump and pulley frame in accordance with plans furnished by the party of the first part. The said second party also agrees to [135] furnish at his own expense a suitable derrick to place over the well at satisfactory height to raise each section of pump and pipe one over the other, each section not to exceed twenty (20) feet; requiring the top of the derrick to be, approximately, 40 feet high.

**TIME OF DELIVERY.**—The party of the first part agrees to make one more step to the already constructed four (4) step pump, and have it ready for shipment on receipt of this contract signed by



the party of the second part, and will send a competent man to Milwaukee to superintend the cutting, threading, and fitting of the discharge pipe and shaft for the pump, and will furnish all material required for the pump and shafting at his own expense, and install the pump in the well on the foundations at the PABST BREWERY in Milwaukee, as specified, on or before thirty (30) days from receipt of this contract signed by the party of the second part.

**COST OF TESTING PLANT.**—It is agreed by the parties to this contract that the party of the second part is to furnish the belt and power and furnish the lubricating oil and labor necessary to protect the bearings from undue wear, and all other labor necessary to operate the pump for ninety (90) days of successful run under the superintendence of a competent man furnished by the party of the first part, or such longer time as is necessary to demonstrate that the pump will do the work as specified.

**PAYMENT.**—The party of the second part agrees to pay for the above pump as specified Twenty-five Hundred (\$2,500.00) Dollars at the expiration of ninety (90) days' successful operation.

**GUARANTEE.**—The party of the first part guarantees the pump as specified, and to have capacity of 700 gallons per minute and [136] require no more than 88 horse-power delivered at the pulley on the top of the vertical pump shaft, and that the shaft bearings, couplings, pipe and pump will be made of the best material and workmanship for the purpose, and when pumping from 400 to 700 gallons per minute at 200 ft. head the shaft will be partially

and approximately balanced by the discharge pressure of water acting on the pump runners, and the unbalanced end thrust of shafting either up or down will be held in place by a suitable end thrust shaft bearing. And the party of the second part agrees to guarantee the party of the first part against loss caused by the well casing being less than 15" diameter or any other cause preventing the free passage of the pumps and pipes into the well, and will accept the plant as specified and pay the contract price when it has operated successfully ninety (90) days with reasonable wear and tear, unless it shall be satisfactorily demonstrated by the consulting engineer of the party of the second part, or by two engineers chosen respectively by the two parties hereto that failure in this respect shall have been caused by failure of supply of water in the well, the said two engineers to determine the method by which this demonstration shall be made. The cost of such demonstration to be paid by the party of the second part.

This contract is contingent upon freight delivery, strikes or other unavoidable delays.

The parties hereto subscribe their names and execute in duplicate.

(Signed) BYRON JACKSON,  
Party of the 1st Part.

Witness:

(Signed) B. H. AMES.

Witness:

\_\_\_\_\_. [137]  
Party of the 2d Part.

(Deposition of Daniel W. Mead.)

Q. Do you of your own knowledge know anything about the execution of this contract Exhibit "M-37," if it was executed by the Pabst Brewing Company?

A. I don't remember whether that was executed or not. I think it was, for your information, but I wouldn't say, because there was so much talk back and forth between the two that I don't remember the final form, although I think this is it.

Mr. LYON.—But whether there was still another draft you don't know? A. I don't know; no.

Q. What next transpired in this matter?

A. I wrote Jackson under date of September 8th for information concerning the results of his test, and the reply under date of September 12th. I have the original of his letter and a copy of my own in my files.

Q. These have been in your files since?

A. They have been.

Q. And one was received and the other written on the dates given? A. They were.

Q. This is the signature of Byron Jackson to the letter? A. It is.

The letter of September 8th produced by the witness was marked for identification Defendants' Exhibit "M-38," and the letter of September 12th so produced was marked for identification Defendants' Exhibit "M-39."

It is stipulated that the letter to the Byron Jackson Mfg. Co. under date of September 8th, 1903, marked Defendants' [138] Exhibit "M-38," and the letter in reply to Daniel W. Mead dated September 12th, 1903, marked Defendants' Exhibit "M-39"

may be received in evidence and copied in the record as follows:

**Defendants' Exhibit "M-38."**

Chicago, Ill., Sept. 8, 1903.

Byron Jackson Mfg. Co.,  
San Francisco, Cal.

Sirs:

You will please advise us concerning the Pabst and Lake Geneva pumps. You agreed to let me know the results of your tests some weeks ago, but I have heard nothing from you except that the preliminary tests were satisfactory. You have never sent me the form of contract for the Lake Geneva pump which I wish to have satisfactory before pump is shipped.

Very truly,

**Defendants' Exhibit "M-39."**

San Francisco, Cal., Sept. 13, 1903.

Mr. Daniel W. Mead,  
Chicago, Ill.

Dear Sir:

Beg to acknowledge receipt of yours of Sept. 8th in which you call my attention to my short comings. I plead guilty but at the same time you know all about it now as I wrote you about my troubles both with the Pabst pump and the Fort Worth pumps. As to the contract for the Lake Geneva pump, [139] I did not know whether to make the contract to be delivered and installed or to be shipped there f. o. b. and in as much as they had asked us to delay the delivery and I had agreed to delay it

(Deposition of Daniel W. Mead.)

any time to suit them, I concluded it was just as well to let it stand for the present until we decided what we would do in regard to the Pabst pump.

Regarding the Pabst pump, I see nothing to interfere with our going ahead and installing them except the matter of the oil injuring the water for their use and I left that question with them to decide because I could not make the kind of a guarantee they asked for; I am a thorough believer that journals must have a little oil and if that spoils the water for brewing, that I thought would cancel the contract, otherwise I expect to see the contract returned; In the meantime we would make the other step to the pump, as I suggested and be all ready to ship it on receipt of the returned contract and if this contract would be satisfactory it would be about the thing with a little modification for the Geneva pump.

Yours truly,

BYRON JACKSON MACHINE WORKS.

Per BYRON JACKSON.

BJ/JAC.

Q. What next occurred, if anything, in this matter, please?

A. The next that occurs in my files is a letter from Byron Jackson dated September 28th, stating the date on which certain pumps would be shipped to me at Ft. Worth, Texas, and containing a comment on the Pabst Brewing company's deep well pump, stating it was finished in five steps, etc. It is an answer to a letter that I had written to him concerning the Ft. Worth pump, which I thought I

(Deposition of Daniel W. Mead.)

had in the Ft. Worth file. It is information [140] concerning the Pabst pump, but simply gratuitously thrown in in a letter concerning the Ft. Worth pump.

Q. When did you receive this letter?

A. I received it about September 28th.

Q. And it has been where since?

A. It has been in my files ever since.

Q. And whose signature is it?

A. Byron Jackson's signature.

The letter last identified to by the witness marked for identification Defendants' Exhibit "M-40."

It is stipulated that the letter from Byron Jackson under date of September 28, 1903, marked Defendants' Exhibit "M-40" may be received in evidence and copied into the record as follows:

**Defendants' Exhibit "M-40."**

San Francisco, Cal., Sept. 28, 1903.

Mr. Daniel W. Mead,  
1st National Bank Bldg.,  
Chicago, Ill.

Dear Sir:

Beg to acknowledge receipt of yours of Sept. 24th. We hope to ship the two new pump cases for Fort Worth in about ten days. They have been successfully cast and are now at work milling them.

I hope that there is something wrong with your data regarding the efficiency of the pumps, the same as there was [141] at Rockford, as you remember the first report I got from there, before I arrived at Rockford, the efficiency was less than

(Deposition of Daniel W. Mead.)

40 per cent and of course our best efficiency there was with the larger quantities of water and I see by your letter you expect to increase the quantity of water at Fort Worth. These Fort Worth pumps are practically the same as the Rockford except that they are two in series and should produce the same efficiency in my judgment.

The Pabst Brewing company deep well pump is finished in five steps including the shaft, couplings and boxes and is waiting the return of the contract from the Pabst Brewing company. I thought best to send this contract to you direct rather than to the company and I would like to know if they have yet received it and what is their decision and why the delay.

Yours truly,

BYRON JACKSON MACHINE WORKS.

Per BYRON JACKSON.

BJ-JAC.

Q. What next occurred?

A. The next is a letter from Byron Jackson to me dated October 7th, 1903, and enclosing a letter-press copy of a letter of Jackson to Pabst, in which he states he had signed the contract and approving the insertion of certain words which they had added to the contract he had submitted.

Mr. LYON.—Is the other letter-press copy of the letter of Jackson to Pabst dated October 7th?

A. Yes, both of October 7th.

Q. This letter of October 7th, 1903, was received by you when? A. About October 10th. [142]

Q. And it has been where since?

(Deposition of Daniel W. Mead.)

A. In my files since.

Q. This is the signature of Byron Jackson?

A. It is.

The letter of October 7th, 1903, identified by the witness, was marked for identification Defendants' Exhibit "M-41," and the letter-press copy so identified by witness was marked for identification Defendants' Exhibit "M-42."

It is stipulated that the letters above referred to marked respectively Defendants' Exhibit "M-41" and "M-42" may be received in evidence and copied into the record as follows:

**Defendants' Exhibit "M-41."**

San Francisco, Oct. 7th, 1903.

Mr. D. W. Mead,

1st National Bank Bldg.,

Chicago, Ill.

Dear Sir:

Enclosed I hand you press copy of a letter I am sending to Pabst Brewing company which explains that we have signed up the contract and are shipping the pump less pipe and shafting.

I am not sending any pulley because it has not yet been determined whether it is to be rope pulley or belt pulley. I expect the speed to be something less than 1200 and recommend a 12" diameter pulley about 18" face and 14" 5-ply rubber belt. [143]

The man that I am sending is at present on the sick list but not seriously so. He is a good worker and capable of installing this plant properly but I have never counted him a success as a diplomat and



yet I trust that there will be no occasion for diplomacy in this matter or expert work in testing as I believe the efficiency of the pump will be considerably better than that named in the contract and I don't apprehend any difficult problem except the oiling but that will depend on the amount of oil that the company will consider satisfactory or objectionable. Yet I should recommend however a free use of oil in the start and then after it has proved to be running successfully with oil, then the oil may be cut down to a limited supply so that it will not injure the water for their use but I very strongly recommend a liberal supply at first as you may understand, the pipes that convey the oil have got to have a surplus there to get the oil started and after they are once lubricated and worn a little free then I think there will be no danger of damage to the bearings even if the oil supply is limited.

I sincerely hope that the job will go through without the necessity of my presence yet I am contemplating an eastern trip and if I can manage the time to see this start I will endeavor to do so.

Yours truly,

BYRON JACKSON MACHINE WORKS.

Per BYRON JACKSON.

BJ/LEW.

**Defendants' Exhibit "M-42."**

Oct. 7, 1903. [144]

Mess. Pabst Brewing Co.,  
Milwaukee, Wis.

Gentlemen:

Beg to acknowledge receipt of yours of Sept. 25th, enclosing our contract for installing deep well

pump, signed by your vice president, Mr. G. G. Pabst. Your insertion of the word "longer" on page three is satisfactory, as I really do not want the time of completion of this contract to be the essence of the contract. It is such a long distance that it really seems impossible to make estimate of time exactly. At present I am disappointed in having a competent and suitable man to install this plant. I had a leading employee at the Works who has recently left my employ to go to his home in Michigan, and I had an arrangement with him to install this plant when it was shipped there, but he wires, in answer to our wire, that it is impossible for him to do so now. Two men in my employ who are competent, are on the sick list and I doubt whether they will be able to undertake the job; two other men in my employ who are competent to do the work are both engaged in work that they cannot leave.

At this writing however I am in hopes that one of the men on the sick list will be able to do the work and if not, I shall have to send a stranger or employ a man in your town to do the work according to plans sent to him. It however is a very plain piece of work so that I hope to have it installed on the time specified, thirty days from date.

We are shipping the pump today and are expressing one shaft coupling and two shaft bearings to be used in fitting [145] the threads, hoping to have the pipe, shafting and pulleys completed there in Milwaukee before the arrival of the pump. If I do not secure a man to send there in the next day or two, will send plans and specifications to

(Deposition of Daniel W. Mead.)

you in hopes that you can select a man in your town that can do the work in advance for us.

Yours truly,

BYRON JACKSON MACHINE WORKS.

Per BYRON JACKSON.

BJ/JAC.

P. S.—Since writing the above I have received a telephone message from our Mr. Robb who is on the sick list saying that he will be able to undertake this work in a day or two. So that I hope he will arrive in Milwaukee some time the first of next week and will be able to get the pipe and shafting and everything ready to receive the pump by the time it arrives.

Q. This copy of the letter of October 7th, 1903, to the Pabst Brewing company, signed by Byron Jackson, was made by whom?

A. Why, it was a copy that Mr. Jackson enclosed in his letter of October 7th to me.

Q. Yes, I see the reference to it in the letter. And this has been in your files since? A. It has.

Q. Is there any further letters to produce in this matter?

A. Well, I have here a letter from Milwaukee, written by Mr. H. Robb, who was erecting engineer for the Byron Jackson Machine Works, in which he notified me that the pumps contracted [146] for by the Pabst Brewing company was running, pumping water 175 feet, quantity of water 800 gallons.

Q. And when did you receive this letter?

A. I received it about January 13th, 1904.

(Deposition of Daniel W. Mead.)

Q. And it is signed by whom? A. H. Robb.

Q. Where has the letter been since?

A. In my files.

Said letter so identified by the witness was marked for identification Defendants' Exhibit "M-43."

It is stipulated that the letter above last referred to marked Defendants' Exhibit "M-43" may be received in evidence and copied into the record as follows:

**Defendants' Exhibit "M-43."**

Milwaukee, Jan. 12, 1904.

Mr. D. W. Mead,  
National Bank Building,  
Chicago.

Dear Sir:

The pump contracted for by the Pabst Brewing company is now running pumping water 175 ft. quantity of water 800 gallons.

Yours truly,

H. ROBB.

At the hour of 5:55 P. M. the examination was adjourned to 9:30 A. M. at the same place. [147]

February 10, 1920, 9:30 A. M.

Examination resumed.

Direct examination of the witness resumed by Mr. Blakeslee.

Q. You have produced a copy of letter dated April 29th, 1903, addressed to yourself and signed Byron Jackson Machine Works by Byron Jackson. When was that copy made?

(Deposition of Daniel W. Mead.)

Mr. LYON.—What is it?

A. This is a letter received early in May, 1903, from Byron Jackson Machine Works in San Francisco, concerning various features of the pumps to be furnished for the Pabst Brewing company, and discussing I think the questions of the contract that had not yet been settled.

Q. And this has been in your files ever since?

A. It has, ever since.

Q. And received by you in due course of mails?

A. It was.

Mr. BLAKESLEE.—Witness has just referred to Defendants' Exhibit "M-44."

Q. Similarly I show you a letter dated May 11th, 1903, a copy thereof, addressed to the Byron Jackson Machine Works. What have you to say as to that?

A. This is a letter written to the Byron Jackson Machine Works by myself and which has been in my files ever since. It was sent in due course of mail.

Q. And on that date? A. On that date.

Mr. BLAKESLEE.—Witness has just referred to Defendants' Exhibit "M-45."

Q. Similarly I show you what purports to be a letter from Byron [148] Jackson Machine Works dated July 7, 1903, and addressed to Daniel W. Mead. Please state similarly as to that.

A. This is a letter received by me from the Byron Jackson Machine Works, about July 9th or 10th, 1903, and received in due course of business; been in my files ever since.

(Deposition of Daniel W. Mead.)

Witness has just referred to Defendants' Exhibit "M-46."

Q. Similarly I show you a purported copy dated January 14th, 1904, addressed to H. Robb, Superintendent. What have you to say as to this paper?

A. It is a letter written by me on January 14th, 1904, to Mr. Robb, Superintendent of the Byron Jackson Machine Works, who had been erecting a pump at the Pabst Brewing Company; sent by me on the date named, in due course of mail.

Q. It has been in your files since?

A. It has been in my files ever since.

Witness has just referred to copy of letter marked Defendants' Exhibit "M-47."

Q. Similarly I show you what purports to be a copy of letter dated January 16th, 1904, addressed to Byron Jackson Machine Works and ask you to similarly state regarding same.

A. This is a letter written by myself to Byron Jackson Machine Works under date of January 16th, 1904, and mailed on that date, which has been in my files ever since.

Witness has referred to Defendants' Exhibit "M-48" so marked.

Q. Similarly I show you a letter dated January 20th, 1904, addressed to Daniel W. Mead, signed by the Byron Jackson Machine Works, and will ask you to state similarly in regard to same. [149]

A. This is a letter received about January 24th, 1904, from Mr. Jackson of the Byron Jackson Machine Works, whose name is added to the type-written signature of the Byron Jackson Machine

(Deposition of Daniel W. Mead.)

Works, received by me in due course of business, been in my files ever since.

Witness has referred to letter marked Defendants' Exhibit "M-49."

Q. Similarly I show you a letter addressed to Mr. D. W. Mead, signed Byron Jackson Machine Works by Byron Jackson, dated February 20th, 1904, and ask you to similarly state regarding same.

A. This is a letter received about February 23d or 24th in due course of business from Byron Jackson Machine Works and it has been in my files ever since.

Witness has just referred to letter marked Defendants' Exhibit "M-50."

Q. Similarly I show you a letter dated March 1st, 1904, and addressed to Mr. D. W. Mead and signed Byron Jackson Machine Works, per Byron Jackson, attached to which is a copy of letter dated February 25th, 1904, and addressed to Mr. Byron Jackson, signed by G. G. Pabst, President, and will ask you to state similarly as to each of these letters.

A. This letter dated March 1st, 1904, is a letter received by me early in March from the Byron Jackson Machine Works and included what was stated in the letter to be a copy of the letter received by Mr. Jackson from Mr. G. G. Pabst, president of the Pabst Brewing Company. The letter was received in due course of business and has been in my files ever since, together with the copy of the Pabst letter attached. [150]

Witness has just referred to letter of Byron Jackson Machine Works marked Defendants' Exhibit

(Deposition of Daniel W. Mead.)

"M-51," and attached copy of letter from G. G. Pabst, president, marked Defendants' "M-52."

Q. Similarly I show you a letter directed to Mr. D. W. Mead dated March 25th, 1904, and signed Byron Jackson Machine Works, per Byron Jackson, and ask you to state as to the same.

This is a letter received about March 26th from Byron Jackson Machine Works, in due course of business. It has been in my files ever since that date.

Witness referred to letter marked Defendants' Exhibit "M-53."

Q. I show you now a group of miscellaneous papers, appearing on their face to be telegrams, copies of letters and letters, between Daniel W. Mead and Byron Jackson Machine Works, dated on several divers dates, and marked respectively Defendants' Exhibits "M-54" to "M-66," inclusive, and will ask you to inspect this group of papers and state whether they are true and correct originals or copies of the correspondence which they purport to be and had at that time, and were transmitted and received by you approximately upon the several dates given and have been in your files since.

A. They are.

Q. And the signatures appearing are known to you, are they? A. They are.

Mr. LYON.—And those which are without signatures, the originals were signed by you and deposited in the mail on or about the dates they bear?

A. They were. [151]

Q. And is that also true with respect to these



(Deposition of Daniel W. Mead.)

other letters that you have identified, where they were missing in signatures, and you have testified that they were letters that you sent?

A. It is. [152]

Letters, documents and papers identified by the witness this morning and referred to as Defendants' Exhibits "M-44" to "M-66," inclusive, are offered and received in evidence as so identified by such letter and number respectively and are copied in the record by stipulation as follows:

**Defendants' Exhibit "M-44."**

COPY.

San Francisco, Cal., Apr. 29th, 1903.

Mr. Daniel W. Mead,

First National Bank Bldg.,

Chicago, Ill.

Dear Sir:

Beg to acknowledge receipt of yours of Apr. 23d, in which I note that you are surprised at the price of \$1,500.00 for the Geneva pump. I presume that you have my letter of explanation that I was not very anxious to have two of these experimental jobs on hand at one time, preferring to have one made and tested before undertaking another. This, of course, had something to do with fixing the price high enough to make it interesting and attractive to me as well as the purchaser.

My price, however, did not include installing, but only included delivery at Geneva; but, of course, it has to include the price of designing, drawings, pattern-making and experimenting, and I feel that the

Pabst Brewing Co.'s contract is quite sufficient for me to undertake as an experiment; but I suppose I could make one as quick as the other if I was to undertake it, yet I would rather not undertake but one at a time until it has been demonstrated. [153]

**PABST BREWING CO.'S PUMP.**—I had hoped to send you the drawings of this pump Saturday, the 25th, but have just this moment received them in the office and hasten to submit them to you, because I think it necessary first to be sure that the well casing will receive this pump, and I think the only way to be sure is to put a dummy pump down the well. This dummy would be made of wood and fastened to a set of well-boring tools and put down the well the 220 ft.

You have no doubt received the contract that I sent you a week ago yesterday, which specifies that the company is to guarantee the well to permit the pump to pass freely through the well casing, and in that specification I named the diameter as  $14\frac{1}{2}$ ", and I made the drawing first that diameter, but afterwards concluded that the imperfections of the well casing could scarcely permit a  $14\frac{1}{2}$ " diameter, and so have made the drawings 14" diameter and marked it so on this drawing I am submitting to-day; but because of it being necessary to make this small enough to go in past the imperfections of the well, I think it advisable to make the patterns so I can reduce the diameter if necessary when I hear from you by wire as to the exact diameter your company will guarantee to pass freely through the well pipe.

**DRAWINGS.**—I think these drawings are suffi-

ciently plain to hardly need further specifications to make you understand them. The pump drawing and the pump head are both made on the scale of 3" to the foot, and are made partially in sections, enough I think to make it clear to you what we propose to do. Some features of this pump are already patented and others that are new I propose to patent if the experiment proves successful. So I trust you will treat these drawings as confidential. [154]

In making these drawings, I first laid out the pump full size, and then made a model of the runner and veins, but after completing the drawings, have decided to make some changes in the proportions, and therefore have only put on a few figures, aiming to guide you in determining whether the well will receive the pump freely through its entire length. The broken section of the pipe, shafting and bearings just above the pump represents one full section just as we propose to make it, and it is also shown in the smaller scale without being broken, and there would be ten sections like this.

You will note that the shafting is inclosed in a 4" pipe and intended to be water and oil tight, and the oil fed in at the top, letting it find its way through each bearing and down the pipe to the pump, where there is arranged suitable drain pipes to permit the water to drain out of the pipe what leaks through the last bearing of the pump where the waste oil will also get out and be pumped through the water, which I presume some people will object to, but, as you know, it is a very homeopathic quantity and does no harm.

**DISCHARGE HEAD AND PULLEY FRAME.**

I did not think it necessary to show this in sections. Will say, however, that the pump shaft and 4" pipe is made water tight in which the discharge ell and both bearings above and below the pulley are separate, castings turned, bored, finished and babbitted and made removable for the purpose of repair, and are held in place by the bolts as shown. The lower bearing is oiled from the side with a large can and pipe which oils the shafting the whole length. The top bearing is provided with ball thrust bearings to carry the weight of the shaft when commencing to pump, and the shaft is intended to be automatically balanced. [155]

I specified in the specifications that it would be approximately balanced, but after making the drawing I believe it will float by the pressure of the discharge water and have no end thrust at all.

**OILING PUMP BEARINGS.**—This is the only feature that I have not worked out to my entire satisfaction. I have thought of making a hollow shaft through the pump and feeding the oil to it by pipe leading from the top, but the difficulty of feeding the oil into a hollow shaft revolving with water leaking through the bearings is not entirely a certain method of oiling against pressure. The only certain way that I have thought of so far, is to make the pump small enough in diameter to permit of an oil pipe passing between the pump and well casing, and if this method of oiling is adopted, the pump has to be that much smaller in diameter.

Another method would be to make the bearings of a combination of brass or babbitt and graphite, and trust to this being satisfactory without any oiling.

**INFORMATION WANTED:**—First, the largest diameter the pump can be made and pass freely through the well casing. Second: Will the Pabst Brewing Co. accept either of the methods suggested for oiling and not reject the pump on account of excessive wear of the bearings, all other parts of the pump being satisfactory as specified?

The reason I want the Pabst Co. to assume this risk of excessive wear to the bearings for the want of oil is because the sum of \$2500.00 is a larger sum than I care to risk on the oiling proposition, because much depends on the attendant who has charge of the pump as well as whether the water is clear or full of sand and grit. [156]

Understand that I am going ahead with the patterns and the manufacture of this pump regardless of whether the Pabst Co. will accept the responsibility of the successful working of these bearings but I might not ship it and install it unless they will accept the pump regardless of the reasonable durability of these bearings.

Hoping to hear from you and the company promptly, we are,

Yours truly,

BYRON JACKSON MACHINE WORKS.

Per BYRON JACKSON.

**Defendants' Exhibit "M-45."**

May 11th, 1903.

Byron Jackson Machine Works,  
San Francisco, Cal.

Gentlemen:

Your various favors of recent date are duly received.

Yours of the 29th, ult. was forwarded to me at Danville, Illinois, from which place I returned Saturday night and found your favor of May 5th at hand.

The contracts were duly sent to the Pabst Brewing Company, but I have heard nothing from them as yet. Presume they have communicated directly with you concerning this matter.

I have today sent them your letters and drawings asking them to have the dummy pump put in the well and to wire you at the earliest possible moment the maximum size of the casing.

Have also written to Geneva Water & Light Company in regard to the Geneva pump. I found on getting further details [157] that the Hart bid was not complete. I have advised these people to accept your proposition, and rather expect they will do so.

Yours very truly.

**Defendants' Exhibit "M-46."**

San Francisco, Cal., July 7, 1903.

Mr. Daniel W. Mead,

Chicago, Ill.

Dear Sir:

**SPECIAL GENEVA PUMP:**—I intended the drawing of this pump to show all the details and was under the impression that it did. They will be the same, however, as the Pabst pump which I think we sent you a complete detail of, showing the oiling device complete, the bearings, however, are plain solid babbitt bearings, the oil in the pump bearings being led to them from the top by a pipe while the

shaft bearings are oiled simply by the waste oil dropping from one bearing to another inside of the 4" pipe. I will make up a contract and submit it to you.

Yours truly,

BYRON JACKSON MACHINE WORKS.

Per BYRON JACKSON.

BJ/PL. [158]

**Defendants' Exhibit "M-47."**

Jan. 14th, 1904.

Mr. H. Robb, Supt.,

Byron Jackson Machine Works,

Milwaukee, Wis.

Dear Sir:

Your favor of Jan. 12th, was duly received.

I am very pleased to hear of the success of the pump you have installed for the Pabst Brewing Co., and trust you will keep me advised as to how the plant is running.

Yours very truly,

**Defendants' Exhibit "M-48."**

Jan. 16th, 1904.

Byron Jackson Machine Works,

San Francisco, Cal.

Gentlemen:

I recently received a letter from your Mr. Robb, from Milwaukee, saying that the pump installed is raising 800 gallons a minute 175 feet high, and is apparently satisfactory to all concerned. Also heard from Mr. Gray, the well driller who sank the well, and who was in Milwaukee last week. He called at my office during my absence, and said the

pump was working very nicely.

In view of this matter, it is very desirable that I know at the earliest possible moment what you expect to do in [159] regard to the pump for the Lake Geneva Water & Light Company. They must have a pump installed before the dry weather comes on. You agreed some time ago to send a form of contract, and, as I wrote you, they wish included in that contract a guarantee on your part against infringement. If you are prepared to go ahead with this, would like the contract signed as early as possible; otherwise the Company will insist on making some other arrangements, as they cannot run the risk of another dry season without reinforcing the supply.

Some days ago I was telling the Engineering News representative of the Pabst plant, and he is anxious to describe it, and to publish a cut of the same. I told him this could not be done, at least as far as the cut was concerned, without your consent. Have you a photograph of this pump, and are you so protected by patents that you could permit them to publish a sectional view.

I believe the success of the Pabst pump will mean a great deal of work for you in this line through this territory, and having the matter well written up by the Engineering News will be the best of advertisement, so it should not be neglected, provided you are sufficiently protected. Of course, I will not allow the use of any prints to the Engineering News or to others without your sanction.

Please let me hear from you as early as possible.

Yours very truly, [160]



**Defendants' Exhibit "M-49."**

San Francisco, Jan. 20, 1904.

Mr. Daniel W. Mead,

1st National Bank Bldg.,

Chicago, Ill.

Dear Sir:—

Beg to acknowledge receipt of yours of Jan. 16th relative to the Lake Geneva Water & Light Company's pump and also the favorable report regarding the Pabst pump, but will take this occasion to say however that we tested the Pabst pump and expected good results. The only question that still remains is as to the durability, which Mr. Robb says the company has practically taken off of my hands in this way; "That they propose to run without oiling after they have connected up to their pipe mains and assume the responsibility of wear and tear because of neglect of oil."

I am sure however that if the bearings are reasonably oiled that it will be durable but whether it will run without oil I think is questionable, but perhaps even this wear and tear would not be prohibitive in the Brewing Company's conditions because it only means a new shaft and rebabbiting the bearings, which of course is a considerable trouble because of having to take the plant out and take it down and set it up again. But otherwise I am sure this outfit is a practical and satisfactory pump.

Mr. Robb has sent me a card taken from the engine Jan. 15th. The data is as follows:—

Pump speed.....1210

Jackson Weir Card,...756 Gallons. 3x48" Weir.

167 Ft. elevation.

Engine speed.....160 Revolutions.

50 lbs. Spring.

Engine 15-1/8x24".

Horse power 52.8.

I have not figured or checked the above figures and do not know who the author is. But if correct certainly the power is not so great as I expected but at the same time I expected good deal better results than our ship test because the shaft exactly floats on the column of water while we had to hold the end thrust with collars.

**ENGINEERING NEWS:**—Regarding a write up in this paper I fully appreciate the advantage of advertising indeed but hardly think it advisable to have a write up just now because for one thing we are having at present a write up on the regular series pump in the Engineering News and next I have some patents pending on this deep well pump.

It is true that I have the series vertical pump patent which I think covers the main features of this pump, but, at the same time, there are other features in this new design patentable which are pending just now.

**GENEVA PUMP:**—As I told you before we had the patterns finished but had deferred the making of it until this pump was tested as to the developments in this pump for showing the desirability of a few changes in the patterns but they don't take much time and I will therefore go forward with this pump and make it at once and will take the first opportunity in the very near future to send you a contract but it will be practically on the lines of

the Pabst contract, regarding oiling and patent infringement. [162]

Of course I will defend all suits that are brought against me for infringements of patents but not any suits that may be brought against the water company or the Pabst Company but I will say however that I have already investigated the state of the art and I don't know of any possible infringement, if I did I would not be making it, but, at the same time, I don't see money enough in it for me to undertake to defend the Water Company against any patent suits on the other side of the Rocky Mountains.

It is possible I may get this pump done in time for Mr. Robb to install it while he is over there, yet at this writing I have not refreshed my memory regarding our correspondence and I do not remember whether they expected me to install it or whether they intend to install it themselves. Besides Mr. Robb says that he does not see any necessity of his remaining in Milwaukee the remainder of the 90 days as he has apparently nothing to do with the running of it. I would like to ask you if you think it necessary or advisable for me to keep Mr. Robb there until the end of the 90 days.

It occurs to me that so long as they waive the durability clause, and if they do that in writing they might as well accept the pump, what do you think?

DITCHING DREDGER.—I have been exceedingly busy all this summer and fall designing and building a brand new ditching dredger and in addition I have had to do the expert designing in

the drafting room, because as I told you, Mr. Vandegrift was nearly dead with the consumption and soon after my return from the east he died and it is not an easy job to get a new man to fill his place, so [163] I am doing it now just as I was when Perry was there and should you know of some young man capable to fill this place that wants it I would like to correspond with him.

This dredger that I referred to above is intended to excavate 200 cubic yards per hour and discharge it on the banks of the levee 150 ft. between centers and excavates a canal 20 ft. deep and 30 ft. on the bottom and 60 ft. or more on the top.

The pump is a 12" dredging pump, the suction and discharge are 12" pipes, the discharge leading to a Y on the top of the barge and there branched off into two 10" pipes, each pipe discharges half of the discharge of the pump on these levees, where the earth is retained or held in place by jetties, I don't know a better name but they are simply made of boards 15" or 20" wide with three stakes nailed to it and braced with a stick like a figure four so that it is only necessary to drop these boards on the levee to check the flow of water and thus a levee can be built up with a slope of nearly one to one, at least in the kind of sandy soil that we are at present operating in.

FORT WORTH PUMPS:—How about Ft. Worth we are needing some money and would be pleased to hear from you.

Yours truly,

BYRON JACKSON MACHINE WORKS,

Per BYRON JACKSON.

BJ/LEW. [164]

**Defendants' Exhibit "M-50."**

San Francisco, Feb. 20, 1904.

Mr. D. W. Mead,  
1st National Bank Bldg.,  
Chicago, Ill.

Dear Sir:—

Answering yours of Feb. 15th, please don't delay paying the balance any longer than you have to, as money would be very handy just now.

GENEVA PUMP:—Has anything occurred to change their minds regarding this pump; If so what is it? The only trouble that Mr. Robb reports is the question of oiling. The Pabst Co., have neglected to oil even the top bearing next to the pulley and that has given some trouble because of wear.

Yours truly,

BYRON JACKSON MACHINE WORKS.  
Per BYRON JACKSON.

BJ/JAC.

**Defendants' Exhibit "M-51."**

San Francisco, Mar. 1, 1904.

Mr. D. W. Mead,  
1st National Bank Bldg.,  
Chicago, Ill.

Dear Sir:—

Replying yours of Feb. 22nd, I enclose herewith copy of a letter from the Pabst Brewing Co. which you will see will indicates that they propose to accept the pump and order some [165] more like it. From the reports that I have from Mr. Robb regarding the difficulty of wearing of the upper bear-

ing, that required some repairs, was certainly no fault of the pump or its design; The lower bearings were not oiled at all, which from my stand-point it was not reasonable to expect that the lower bearing would stand the wear and tear without some kind of lubrication, besides, it is a simple matter to provide grease for this upper bearing and not let it get into the water;

I expect to improve the next pump so that the end thrust will be less than on this; In fact I am a little disappointed that there is any weight at all on these ball bearings, except when starting the plant. The last report from Mr. Robb, is that the new bearings have run considerable time without showing any wear.

I have been holding the Lake Geneva Water Co's. pump back in order to get a full report from this plant; But the reports so far are favorable and I have every reason to believe that this new pump will be a success, yet I do not desire to push it on the market until we have had sufficient experience with it to be reasonably sure of the results after placing it in the hands of unexperienced people. I do not favor pushing new machinery into the market and depending only on shop tests or expert work, but desire to have it thoroughly tested in the hands of the average user.

So I am perfectly content to cancel the Lake Geneva Water Co's. order, or accept it on most any conditions that they want, with the exception of the patent clause and the necessity of oiling, because I am not a believer of water lubrication, although it answers to a certain extent; I do not believe either

that a little oil can be so very objectionable for water. Of [166] course in the Pabst Brewing Co's. case it may be absolutely prohibitive, but for City Water Works, it has been demonstrated thoroughly that a little oil will do no harm; The objection is purely an imaginary quantity. Besides, we are scheming on devices that we think we will be able to oil this shaft without permitting it to get into the water that is pumped by it.

PATENTS:—I do not consider it good business to undertake to protect other Companies or your customers from patent suits that may be filed against them for the use of your machinery. I am perfectly willing to stand any suit that is filed against me, because I do not infringe anybody's patents that I know of, but there may be suits filed against our customers for many reasons and make us annoyance and cost and bother and I shall have to decline to do so under any conditions and never have had to do it to secure an order. Besides I am getting a little more independent than I used to be in this matter and I make my own contracts and if the purchaser wants anything in it that I don't like, I let them go elsewhere to get their goods. We certainly have a good patent on our Series pump and the new devices that are on this pump are certainly mine and I am not afraid of infringing anybody; I think that the Pabst letter shows that they have every confidence in this pump and Mr. Robb's letters are to the same effect.

I hope that you will communicate to the Lake

Geneva Water Co., some of the statements above.

Very truly yours,

BYRON JACKSON MACHINE WORKS,

Per BYRON JACKSON.

BJ/JAC. [167]

**Defendants' Exhibit "M-52."**

COPY.

Milwaukee, Wis., Feb. 25th, 1904.

Mr. Byron Jackson,

San Francisco, Cal.

Dear Sir:—

Your Mr. Robb was in the office today with a supplemental agreement which he asked me to sign. While there is no question in my mind at the present time that the pump will be accepted by us, I really do not wish to sign the paper without first talking the matter over with you. You no doubt will recall our correspondence previous to closing the contract with you and that we offered to pay the expenses of your man to come to Milwaukee to erect and superintend the operation of the pump, and that this amount was added to the original price made us by you. For that reason we hardly think your position is perfectly just one to have your Mr. Robb return before the expiration of the time specified. With no further explanation from you that seems to be the object of your supplemental agreement.

I realize that we have released you from your guarantees by lubricating the wearing parts with water but we are pleased to say that the test so far has come out all right.



I have asked your Mr. Robb to get measurements and data of our wells with a view of equipping them with your Centrifugal pumps while we are waiting for a reply from you. We have three or four wells all supposed to be of the same diameter as the one for which you furnished the pump and we would thank you to give us your lowest price apiece for three or four more pumps. [168]

As the pump has been running very well the past few days we believe it would be safe for your Mr. Robb to return home, as I have no doubt you can make use of his services.

Awaiting an early and favorable reply,

Yours very truly,

(Signed) G. G. PABST,

President.

**Defendants' Exhibit "M-53."**

San Francisco, Mar. 25, 1904.

Mr. D. W. Mead,

1st National Bank Bldg.,

Chicago, Ill.

Dear Sir:—

I have just received telegrams from our Mr. Robb at Milwaukee, saying that the Pabst Brewing Co. have accepted the pump and handed him check for and also placed an order for three more similar pumps. I hope there is no mistake in this, because if true, it is a pretty good indication for the new pump, notwithstanding we have had some troubles there. We have had no troubles however, other than what might be expected under the conditions and certainly the pump is more durable without using

oil, than I expected, if I understand Mr. Robb's reports.

Please make it convenient to send us some money as we are hard up and could use it now to advantage. Please let us hear *from* you are getting along with the pumps at Fort Worth.

GENEVA PUMPS:—I am not so anxious for this order, because I want to go slow on these pumps until I know I am right. If you [169] see fit to tell them that the Pabst Company have accepted the present one and ordered three more, it might set them to thinking and do me no harm surely, and I would be under many obligations to you for it.

Yours very truly,

BYRON JACKSON MACHINE WORKS,

Per BYRON JACKSON.

BJ/JAC.

**Defendants' Exhibit "M-54."**

(TELEGRAM)

MI. . . . Sanfrancisco Calif Apl 18-03.

D. W. Mead,

First Natl. Bank Bldg.,

Chicago.

Geneva pump fifteen hundred dollars delivered sixty days to succeed to abandon before shipment.

BYRON JACKSON MACHINE WORKS,

1006pm.

**Defendants' Exhibit "M-55."**

Feb. 22nd, 1904.

Byron Jackson Machine Works,  
San Francisco, Cal.

Gentlemen:—

Concerning the pump for the Lake Geneva Water & Light Company, I wish to say that Mr. W. E. Hinchliff of Rockford, Ill., who represents the principal owners in this plant, writes me that he has visited Milwaukee and seen the Pabst pump in operation. He says that he is not satisfied that the mechanism [170] will stand up under the work, with reasonable expense. He states that some of the bearings at Milwaukee have already been renewed because of the crushing of the balls, or something of that kind. He also says, in regard to the matter of possible patent litigation, "We have been warned regarding infringement, and after such warning a suit might go hard with us, if it developed that there was an infringement."

In view of the above, and especially the clause in regard to infringement which you refuse to incorporate in the contract, it is apparent to me that a satisfactory contract cannot be drawn between yourselves and the Lake Geneva Water & Light Company. I should, therefore, advise an entire discontinuation of further work on this pump, unless you are willing to insure this Company against the question of patent litigation, and unless the mechanical defects, concerning which Mr. Hinchliff writes, can be remedied.

Yours very truly,

**Defendants' Exhibit "M-56."**

April 14th, 1903.

Byron Jackson Machine Works,  
San Francisco, Cal.

Gentlemen:—

I visited Lake Geneva, Wisconsin, yesterday in the interest of the Lake Geneva Water & Light Company. This Company has an artesian well 12 inches inside diameter. The water stands about 60 ft. below the surface, and is expected to fall to a depth of about 100 ft. below the surface when pumping [171] at the rate of 700 gallons per minute.

This Company desires figures, for immediate delivery, on a centrifugal pump to go in this well, of a capacity sufficient to raise 700 gallons per minute from a depth of 100 ft., including necessary drop pipe, power head and pulley (for use with the steam engine), bearings, etc., to place the pump 100 ft. below the surface, and a suction pipe at least 20 ft. longer to bring the total down to 120 ft.

It is important that this work be completed at the earliest possible moment, in order to prepare for the excessive demand for water during the hot weather, and the Company desire me to ask you, on receipt of this, to immediately wire me a price on the delivery of this pump at Lake Geneva, Wis., and the earliest time at which you will guarantee to ship the same.

As the matter is exceedingly important to the Company, I shall feel greatly obliged if you will give this matter immediate attention,

Yours very truly,

**Defendants' Exhibit "M-57."**

April 23rd, 1903.

Byron Jackson Machine Works,  
San Francisco, Cal.

Gentlemen:—

Your dispatch of the 18th, inst., reading "Geneva pump \$1500.00, delivered sixty days, to succeed or abandon before shipment" was duly received.

I was somewhat surprised at the price named, as I had [172] supposed from the figures you named me when I was in San Francisco last May that a pump of this sort could be built for something less than \$1000.00, and had given the Geneva people to understand as much. Does the price named contemplate your delivering and erecting this pump, and did I make it plain that the lift was to be only 100 feet? I am anxious to see you put this pump in at Geneva because I am satisfied you will do us a first-class job, but would like to hear from you as to just what your proposition contemplates.

We have a considerable amount of 8" wrought iron pipe at Geneva, and I thought possibly you might be able to utilize this and perhaps save some expense in that way.

E. C. Hart & Co. have offered to install a pump in this well, I understand, for about \$750.00, but I have no confidence in them, and the Water Works Company, following my judgment in the matter, are indisposed to let them have the work, although, of course, the price they name is somewhat attractive.

If, by our furnishing pipe, or by your erecting

the work, we could get the price down to not over \$1200.00, I think the Company would be disposed to place the order with you.

Please look this matter over, in view of the circumstances and conditions mentioned above, and advise me at your earliest convenience as to what you can do. Please send a sketch of the pump you would propose to install, so that I may submit it to the Company.

I trust I may receive a reply by the earliest mail.

Yours very truly, [173]

**Defendants' Exhibit "M-58."**

(TELEGRAM)

June 3rd, 1903.

Byron Jackson Machine Works,  
San Francisco, Cal.

Geneva well eleven and one-half inches clear.  
Please rush pump as fast as possible.

DANIEL W. MEAD.

PAID.

**Defendants' Exhibit "M-59."**

San Francisco, Cal., Apr. 20, 1903.

Mr. Daniel W. Mead,  
1st National Bank Bldg.,  
Chicago, Ill.

Dear Sir:

Regarding the Geneva Pump,—it will require new patterns and new design and while it is true the lift is only 100 ft., only half that of the Pabst Brewery Co.'s pump, the diameter is much less and therefore is more difficult to get the capacity and

head, but if we can succeed with one, we can succeed with the other in the same time and while I would rather not have two such conundrums on hand at one time, I will undertake it if your clients will pay the price if I was to deliver and install this on the same terms as the Pabst pump and want \$2000. This price of course includes freight so that all I would have to add would be the man's time attending to it. The same man could probably attend to both pumps.

I am unfortunate in not having Mr. Vandegrift here to [174] help me do this work. I have two draughtsmen in the drawing room, but neither of them have experience in this line of work. So I have got to rely entirely on myself unless Mr. Vandegrift returns before I arrive at a decision.

Yours truly,

BYRON JACKSON MACHINE WORKS.

Per BYRON JACKSON.

BJ/PL.

**Defendants' Exhibit "M-60."**

**Defendants' Exhibit "M-61."**

Defendants' Exhibits "M-60" and "M-61" are identical in every respect with Defendants' Exhibit "M-57" and are therefore not copied into the record. The original exhibits are, however, attached to the original deposition.

**Defendants' Exhibit "M-62."**

Danville, Ill. 5-14-03.

Byron Jackson Machine Co.,

San Francisco, Cal.

Gentlemen: I discussed the pump question by long

distance phone today with the Lake Geneva Wis. Water and Light Co—and they decided to accept your proposition for a pump. I told them to have measurements made of inside of casing at once and I will advise you by wire as soon as they make them. They need the pump badly and I trust you will go ahead with it as rapidly as possible. We shall expect you to ship within the sixty days agreed. Send on your contract.

Very truly,

DANIEL W. MEAD. [175]

**Defendants' Exhibit "M-63."**

August 21st, 1903.

Byron Jackson Machine Works,

San Francisco, Cal.

Gentlemen:

I am in receipt of the following letter from Mr. W. E. Hinchliff, who is the principal owner of the Lake Geneva Water & Light Plant.

The season is so far advanced that they apparently have no need for the pump during the present season, and, for financial reasons, would prefer to let the matter rest until next Spring, giving you more time to complete the work to your full satisfaction.

You will note what they say concerning the Hart people. I do not think that Hart has any patents; however, this same question is bound to arise, and if you have applied for a patent on your pump, and have had the records searched, you can probably give some definite information as to whether there is a possibility of infringement or not.

Yours very truly,



**Defendants' Exhibit "M-64."**

San Francisco, Cal., May 18, 1903.

Mr. Danl. W. Mead,  
Chicago, Ill.

Dear Sir:

Both Mr. Jackson and Mr. Vandegrift are out of town and will not be back for a few days, but will make contract and [176] plans for Geneva pump immediately on return of either.

Your telegram regarding diameter of Pabst pump is not very clear. Part of the patterns are already made for 14" diam. I hope and believe that you can spread the pipe by suitable taper plug, making it receive 14" diam pump. But we will suspend this portion of work until we hear from you, so that the pump can be made less diameter if necessary.

Yours truly,

BYRON JACKSON MACHINE WORKS.

Per AMES.

BA/JAC.

**Defendants' Exhibit "M-65."**

San Francisco, Cal., May 20, 1903.

Mr. D. W. Mead,  
Chicago, Ill.

Dear Sir:

We are in receipt of yours of May 14th regarding the Geneva pump. Also your telegram of same date saying "Go ahead with Lake Geneva pump. Am having well measured." On receipt of this telegram, I was out of town, so there was nothing

done on the work until today. I will make the contract and forward same as soon as we *we* have had time to make some drawings, so as to make it approximately definite in the specifications what we propose to make.

I had given up the idea of getting this order, as I supposed our competitor the E. C. Hart Co., bid of \$750.00 would take the order. Even now I am undecided as to whether you [177] accepted the bid on the pump f. o. b. Geneva for \$1500.00 or installed for \$2000.00. So unless I hear from you before I forward the contract I will make it up both ways, so that you can have your option.

Yours truly,

BYRON JACKSON MACHINE WORKS.

Per BYRON JACKSON.

BJ/JAC.

**Defendants' Exhibit "M-66."**

San Francisco, Cal., June 13, 1903.

Mr. Daniel W. Mead,  
Chicago, Ill.

Dear Sir:

Enclosed I hand you the blue print of the drawing we made for the Geneva Lake Water Co. We found it more difficult to make a satisfactory design for this pump in a 12" wheel than for the Pabst Brewing Co. in the 15" wheel and we expect the best efficiency from the larger diameter pump.

After completing this drawing there will probably be some slight changes, but not enough to require mentioning. Please note that the method of oiling the bearings in the pump by a single pipe

(Deposition of Daniel W. Mead.)

from the top is quite clearly shown in this drawing and why the Pabst Co. should specify that there was no oil to be mingled with the water is a mystery to me except to assume that they did not study the question or else they wanted to be more technical than necessary. Besides it seems to me if they were going to take any action about a contract, it was [178] about time they were doing it as they have had ample time and they expect us to be in time. I am a little in doubt whether we will get done in 60 days though we have got far enough along now so that we can push the work and hope to have it tested in a short time. I am submitting you the drawing 1.E.73, and hope you will carefully consider it and see if there is anything that you can suggest that will help us out, or if there is anything that will prevent its successful installation by the purchasers.

I have not yet written up any contract for this and have been waiting to know whether we were to install it or whether they were to buy it F.O.B. cars Geneva.

Hoping to hear from you soon, I am,

Yours truly,

BYRON JACKSON MACHINE WORKS.

Per BYRON JACKSON.

Gn. Ct.

BJ/PL. [179]

Q. Please state of your own knowledge what was done with the original letter, of which you have testified Defendants' Exhibit "M-44" is a copy.

A. It was sent to the Pabst Brewing Company.

(Deposition of Daniel W. Mead.)

Q. By whom?

A. By me. "M-44" is a copy of letter received by me from the Byron Jackson Machine Works, referring to the Pabst Brewing Company matter, and sent to them for their information, and a copy retained for my own files.

Q. Can you state when you sent that original letter to the Pabst people?

A. It was early in May, 1903.

Mr. LYON.—Q. You have no way of fixing the exact date?

A. No. Well, now, I don't know. Just wait a minute. If you want that exact date possibly I can give it to you. What is the date of that letter?

Q. April 29th, 1903.

A. I sent a copy of that letter to the Pabst Brewing Company on May 11th, 1903.

Mr. BLAKESLEE.—Q. Have you any record of so sending this Byron Jackson letter of April 29th, 1903, to the Pabst Company?

A. I have a letter dated May 11th, 1903, addressed to the Pabst Brewing Company, Milwaukee, Wisconsin. Mr. G. G. Pabst, Vice-president, which is a carbon copy of the letter sent to them on that date and which has been in my files ever since.

Q. And was signed by you when you mailed it?

A. It was signed by me; yes. [180]

Witness refers to letter marked for identification Defendants' Exhibit "M-67."

It is hereby stipulated that the letter to the Pabst Brewing Company under date of May 11th, marked

(Deposition of Daniel W. Mead.)

Defendants' Exhibit "M-67," may be received in evidence and copied into the record as follows:

**Defendants' Exhibit "M-67."**

May 11th, 1903.

Pabst Brewing Co.,  
Milwaukee, Wis.

Mr. G. G. Pabst, Vice-pres.

Dear Sir:

I am in receipt of a letter from Byron Jackson dated April 29th forwarded to me at Danville, Ill., together with certain drawings. Copy of the letter as far as it refers to the pump for your place is enclosed herewith. I have just returned from Danville and also find a letter from Mr. Jackson dated May 5th, copy of which is enclosed herewith.

You will note from Mr. Jackson's first letter that he thinks it is very essential that a dummy pump should be lowered into the well. You will note in the copy of his contract sent you some time ago that he asks you to guarantee the diameter of the well. This, of course, we will have to accept, as it is a matter beyond Mr. Jackson's control, and I think the only safe way would be to insert the dummy pump as he suggests. I would suggest that this be done, and the largest diameter which can be guaranteed wired Mr. Jackson as early as possible.  
[181]

Yours very truly.

It hardly seems to me that Mr. Jackson should require you to guarantee the bearings. As I understand it, you are virtually paying him \$500.00 for a

(Deposition of Daniel W. Mead.)

ninety day test, and if there is excessive wear shown in these ninety days, he should certainly make any corrections which the indications require at that time. I hardly think Jackson would refuse to ship the pump on this account, although you will note he suggested it in the last paragraph.

I have heard nothing from you concerning the contracts which I forwarded to you from Danville a week or ten days ago. Would you kindly advise me what action you have taken in this matter?

Please note that the first page of Mr. Jackson's letter of the 29th, refers to a pump for the Lake Geneva Water & Light Co. which is to be 100 ft. below the surface, and furnish 700 gallons per minute.

Yours very truly,

Q. Did you receive any reply *from* to this letter from the Pabst people?

A. Under date of May 12th, 1903, I received an acknowledgment of receipt of my letter, together with the enclosures, signed by the Pabst Brewing Company, Mr. G. G. Pabst, Vice-president, which has been in my files ever since.

Witness refers to letter marked for identification Defendants' Exhibit "M-68."

It is stipulated that the letter above last referred to marked Defendants' Exhibit "M-68" may be received in evidence and copied into the record as follows: [182]

(Deposition of Daniel W. Mead.)

**Defendants' Exhibit "M-68."**

Milwaukee, Wis., May 12, 1903.

Mr. Daniel W. Mead,

First National Bank Bldg.,

Chicago, Ill.

Dear Sir:

We have yours of the 11th inst. as well as the various enclosures sent therewith.

Yesterday we sent you blue prints showing the result of the work we have been carrying on to find the true diameter of the hole for the Jackson pump. We think it might be advisable for you to telegraph this diameter to Mr. Jackson and also tell him that a letter from us and the contract will follow shortly.

We are again going to make a test of the diameter with a dummy pump as suggested by Mr. Jackson. This will take us several days but we shall use our utmost efforts to get the work done as quickly as possible. Upon the completion of this test we shall communicate with you at once.

Yours very truly,

PABST BREWING COMPANY,

G. G. PABST,

Vice-president.

GGP/AHM. [183]

Q. I note that the letter to you from the Byron Jackson Machine Works, a copy of which is marked Defendants' Exhibit "M-44," refers to certain drawings. Do you know where those drawings are to-day? A. I haven't any idea.

(Deposition of Daniel W. Mead.)

Q. Do you know what was done with them after you received them?

A. They were sent to the Pabst Company.

Q. Are they within your control at the present time? A. They are not.

Q. Please look among the blue-prints and miscellaneous papers on the table here and see if you can discover any drawing that in any way bears resemblance to the drawing you have last mentioned as having been sent to the Pabst Company.

A. I find four drawings which are essentially similar to those which I was receiving about the date mentioned. I can only certify to them in general design. I don't remember of course the details; that is, the dimensions. They are the drawings designated by the numbers 3. C. 73, 1-E-72, 1-E-70, and R-109.

I am incorrect in regard to my statement. When it comes to getting these down to a definite date, I couldn't certify to having received any of these drawings at a certain date. I can only certify to having seen the drawings or similar ones, in connection—

Mr. LYON.—At some time.

A. Well, about this time. It was in connection with this Geneva and Pabst pumps. I remember very distinctly the details, but I don't remember any dimensions. And these were all you understand received about the same time. Well, I couldn't [184] certify that any one of these was received with that particular letter. I wouldn't



(Deposition of Daniel W. Mead.)

undertake that, because I couldn't recall it.

Q. Did you want to add this (indicating) in that group?

A. I want to revise that statement and say that I apparently misstated the facts in saying that those drawings that were hitherto mentioned were received with that particular letter. They were simply received in connection with the pumps purchased for the Pabst Brewing Company and for the Lake Geneva Water Company, and I won't attempt to state the time of the receipt closer than the year 1903. I couldn't say just exactly which letter was received on certain dates.

Q. Which drawing, you mean?

A. Which drawing was received on certain dates. I couldn't attempt to do that.

Q. Are you prepared to state the time in the year 1903?

A. No, I couldn't say; except that it was received during that year.

Mr. LYON.—Now, I suggest that you call the numbers of these drawings or blue-prints which have been on the table, so as to just clear the witness' testimony.

(The numbers of the drawings given by the witness were read by the reporter and checked by the witness with the drawings).

The WITNESS.—This is another one I have seen: 2-D-40. Just what date I don't remember.

Q. That same year? A. Yes.

The WITNESS.—That (indicating) was a drawing submitted [185] to me, and I am not sure

(Deposition of Daniel W. Mead.)

whether this was the Pabst or the Lake Geneva.

Mr. LYON.—That is drawing 3-E-22? A. Yes.

Q. Have you in your files any of the originals of these prints just identified by you, or copies thereof?

A. No, I have not. They were all forwarded to the companies that purchased the pumps and I have never seen them since as far as I remember. Jackson wasn't fond of sending out duplicate copies, so I never had any—

Mr. BLAKESLEE.—We offer in evidence these prints just selected by the witness in his recent testimony, as follows:

1-E-72 as Defendants' Exhibit "M-69" (which for the purpose of comparison on the record we believe will be found to agree with Defendants' Exhibit 5).

1-E-70 as Defendants' Exhibit "M-70" (which we believe on comparison will be found to agree with the corresponding marked tracing of Defendants' Exhibit 6).

R-109 as Defendants' Exhibit "M-71" (which we believe on comparison will be found to agree with the similarly identified tracing of Defendants' Exhibit 6).

3-C-73 as Defendants' Exhibit "M-72" (which we believe on comparison will be found to agree with the similarly marked tracing of Defendants' Exhibit 6).

1-E-73 as Defendants' Exhibit "M-73" (which we believe on comparison will be found to agree with the similarly marked tracing of Defendants' Exhibit 6).

(Deposition of Daniel W. Mead.)

2-D-40 as Defendants' Exhibit "M-74" (which we believe on comparison will be found to agree with the similarly [186] marked tracing of Defendants' Exhibit 6).

3-E-22 as Defendants' Exhibit "M-75" (which we believe on comparison will be found to agree with the similarly marked tracing of Defendants' Exhibit 6).

Mr. LYON.—We object to each of the above offers as irrelevant, immaterial and incompetent, no foundation laid; and object to the parenthetical statement after each offer as not evidence, the said Defendants' Exhibits 5 and 6 speaking for themselves.

By Mr. LOFTUS.—A duplicate of each of Exhibits "M-69" to "M-75," inclusive, are attached to this deposition in Case No. 485 and offered in connection therewith.

Mr. LYON.—To which we urge the same objection as just noted on the record; but no objection to the fact that they are duplicate copies. In other words, we do not object to the fact that the attached blue-prints are not the identical blue-prints that the witness picked out, but are duplicates thereof produced by counsel.

(By Mr. BLAKESLEE.)

Q. Mr. Mead, I hand you Defendants' Exhibit "M-44," being the letter of the Byron Jackson Machine Works addressed to you April 29, 1903, and at the same time I hand you Defendants' Exhibit "M-74," being a blue-print bearing the legend "2-D-40," and ask you whether or not said blue-print has anything to do with the drawings discussed in the said letter of April 29, 1903?

(Deposition of Daniel W. Mead.)

Mr. LYON.—That is objected to as leading and suggestive and as having fully been answered by the witness [187] in so far as he has been able to do so; and as incompetent, not the best evidence, no foundation laid for the introduction of secondary evidence, and no foundation laid for the witness to answer the question; and as calling for the conclusion of the witness and incompetent for this reason.

Q. In that connection please read the said letter carefully.

Mr. LYON.—I repeat each of the said objections.

A. I think that this blue-print 2-D-40 is a copy of the blue-print which accompanied the letter of April 29, 1903. I can only identify it as regards the general design and some of the figures that are contained in the letter which are identical with those shown on the print; but there are many other dimensions of which I have no distinct recollection.

Mr. LYON.—I move to strike the answer from the record and exclude it from consideration upon each of the grounds stated in the objection.

Q. As between these several blue-prints last identified by you and offered in evidence, including this blue-print 2-D-40, is your recollection any clearer as to any one of them than as to the others with respect to its accompanying this letter Defendants' Exhibit "M-44"?

Mr. LYON.—That's objected to as leading and suggestive and as having been fully answered, as incompetent, no foundation laid calling for the conclusion of the witness and not for a statement of fact.

A. I think this 2-D-40, which was a general draw-

(Deposition of Daniel W. Mead.)

ing, not in very great detail, but showing some of the principal details, and which was partially to show the necessity of carefully calibrating the well for diameter, and which is dated simply [188] the day before the letter of April 29th, and in which letter Mr. Jackson says he has just received the blue-print, and which was the essential blue-print for my work at that time—makes me believe that this was the blue-print that accompanied the letter of April 29th, 1903.

Mr. LYON.—We move to strike the answer from the record and exclude it from consideration upon each of the grounds stated in the objection; and upon the further ground that it is incompetent, merely the guess or deduction of the witness and not a statement of fact, argumentative.

Q. When you received this blue-print like 2-D-40, please state, if you recollect, what you understood the blue-print to disclose to you as to its various features.

Mr. LYON.—We object to that as incompetent irrelevant and immaterial, the Exhibit "M-74," blue-print 2-D-40, speaking for itself.

Mr. BLAKESLEE.—We are dealing now with the question and defense of disclosure on the part of the witness.

Mr. LYON.—The further objection to a mere disclosure on the ground that it is immaterial and too late, being subsequent to the execution of the application for the patent in suit by Mahlon E. Layne, and the disclosure being subsequent to the actual filing of the Layne application for the patent in suit.

Mr. BLAKESLEE.—This is only one phase of the

(Deposition of Daniel W. Mead.)

continuing acts regarding this invention, as covered by our several defenses.

(Question read.)

A. Well, it disclosed in general the details proposed for the [189] Pabst pump, in giving its number of steps, the outside dimensions, the arrangement of the steps to each other, and the arrangement of the discharge and of the shaft and bearings, in a general way; the drawing not being a complete drawing of the entire installation, but only the lower portion, together with the subdivision of the discharge pipe, shaft and enclosing pipe as they would appear in the casing above the pumps; together with also a detail showing how the bearings were maintained in position and the adjustments necessary for alignment, as adapted by the Byron Jackson Machine Works to this Pabst pump. By alignment I referred of course to the alignment of the shaft, which was in the neighborhood of two hundred feet long and ran from the surface down to the pumps located approximately two hundred feet below the surface in the 15-inch drive casing.

Q. What did you understand to be the organization of the parts designated at the upper left-hand corner of this drawing by the words "Bearing A" and "Bearing B"?

A. They represent the bearings that maintained the shaft in alignment, and the Bearing A showed an adjustment whereby the inner pipe would be lined up by certain adjustments to take care of any irregularities in the outer or discharge pipe.

Q. And what did you understand by the vertical

(Deposition of Daniel W. Mead.)

lines parallel with the shaft in these bearing parts and just slightly placed from the shaft?

Mr. LYON.—The same objection last noted on the record to the preceding questions, including all of the objections to the preceding questions. [190]

A. Those were places I understood where bearing metal would be in contact with the shaft and contained in the bearing proper.

Q. What did you understand to be the part in this drawing in the upper left-hand corner, which is given a dimension figure of  $3\frac{3}{4}$  inch?

A. That was the inside diameter of the pipe which separated the shaft from the discharging water.

Q. And what did you understand to be the part adjacent thereto designated by the dimension figures  $8\frac{5}{8}$  inch?

Mr. LYON.—Same objections.

A. The  $8\frac{5}{8}$  inches represented the inside diameter of the discharge casing.

Q. What was its relation to the inside  $3\frac{3}{4}$  inch casing?

A. Between the two casings there was an annular space through which the water was discharged.

Q. And how were their axes to be related—these two casings?

Mr. LYON.—Same objections.

A. Concentric.

Q. You have spoken of a pump I believe for the Geneva Water Company or Geneva Lake Water Company.

A. Well, the water company at Geneva, Wisconsin. The name I don't recall particularly at this

(Deposition of Daniel W. Mead.)

time, because I have had no dealings with them for nearly twenty years.

Q. What sort of a pump was that?

A. Well, it was a similar pump. My recollection is—

Mr. LYON.—Objected to as incompetent, not the best evidence, no foundation laid for the introduction of secondary evidence, and as irrelevant and immaterial.

A. It was similar to the pump to be furnished to the Pabst [191] company, with the exception that it was smaller in diameter and the lift was only about a hundred feet. My recollection is that the casing in which it was to be placed was something like 11 or 12 inches and that the lift was essentially one hundred feet.

Q. When was that pump installed?

(Same objection.)

A. Well, that I can't say. I arranged for its purchase during the year 1903 as shown by the correspondence which has already been submitted, but there was some delay and some postponement of the installation, and there was some misunderstanding a little later concerning my relations with the company and I lost track of the proposition, simply knowing in a general way of the installation of the pump, but nothing whatever concerning its operation or what it accomplished.

Mr. LYON.—In view of the last answer of the witness we move to strike the entire testimony given and answered by the last questions in regard to such Geneva Lake pump installation from the record and



(Deposition of Daniel W. Mead.)

exclude the same from consideration, not only upon each of the objections and grounds stated in the objections to the questions, but upon the further ground that it is incompetent, no foundation laid, the witness not having been qualified to answer the questions.

Q. Did any drawings of any kind ever come to your hands in connection with this Geneva Lake Water Company matter?

A. My recollection is that I had full detailed drawings pass through my hands and were forwarded to the Lake Geneva Water Company. I did not retain any of the drawings, however.

Q. Do you know where any of them are to-day?  
[192] A. I do not.

Q. What was your relation to that matter?

A. I was engineer for the Lake Geneva Water Company.

Q. And you do not know where any of those drawings that passed through your hands are at present, namely, those relating to the Lake Geneva Water Company matter? A. I do not.

Q. Please look among the tracings and miscellaneous papers on the table here and see if you recognize anything which bears any resemblance to such tracings or drawings.

Objected to as incompetent, no foundation laid—not the best evidence and no foundation laid for the introduction of secondary evidence; calling for the mere conclusion or guess of the witness and not the proper method of proof, and as irrelevant and immaterial.

(Deposition of Daniel W. Mead.)

A. I find one among the blue-prints already mentioned which is designated by the letters and figures 1-E-73, and also find two others: one designated as 1-C-96 and one as 3-C-74, that were drawings prepared for the Lake Geneva Water Company, and according to the best of my recollection are in all essential details similar to those received by me as engineer for that company and forwarded to the company. I could verify them only as to general details and not as to exact dimensions.

Q. When did you receive drawings such as you have stated in this Lake Geneva Water Company matter from Byron Jackson Machine Works?

A. Some time during the year 1903, the summer of 1903. Some time during the summer. I couldn't locate it any closer than that. [193]

Mr. BLAKESLEE.—We offer in evidence the two additional blue-prints just selected by the witness, as follows: The blue-print 3-C-74 as Defendants' Exhibit "M-76" (which we believe will be found on comparison to agree with the similarly marked tracing in evidence as part of Defendants' Exhibit 6). And we likewise similarly offer in evidence the blue-print 1-C-96 as Defendants' Exhibit "M-77" (which we believe on comparison will be found to agree with the similarly marked tracing in evidence as part of Defendants' Exhibit 6).

Mr. LYON.—Objected to as incompetent, no foundation laid; not the best evidence; no foundation laid for the introduction of secondary evidence; and as irrelevant and immaterial, being subsequent to the date of the filing of the application for the patent in

(Deposition of Daniel W. Mead.)

suit. The objection to the parenthetical statement as to comparison of said alleged blue-prints and portions of Defendants' Exhibit 6 is made, that the same is not competent as evidence and that Defendants' Exhibit 6 and each of the parts thereof speak for themselves.

By Mr. LOFTUS.—A duplicate of each said Exhibits "M-76" and "M-77" are attached as exhibits to this deposition in Case No. 485 and offered in connection therewith.

Mr. LYON.—To which we urge the same objection as just noted on the record, but no objection to the fact that they are duplicate copies. In other words, we do not object to the fact that the attached blue-prints are not the identical blue-prints that the witness picked out, but are duplicates thereof produced by counsel. [194]

Q. Can you recollect any other installation which was made with bored well, centrifugal pump and other features of installation, in any dealings involving yourself and the Byron Jackson Machine Works of San Francisco, other than the Geneva Lake Water Company and the Pabst Brewing Company installations?

Mr. LYON.—It calls for a yes or no answer.

A. I do recall installations.

Q. Will you please tell us what they were.

Mr. LYON.—That's objected to as incompetent, not the best evidence, no foundation laid for the introduction of secondary evidence, and as irrelevant and immaterial, unless such installations are iden-

(Deposition of Daniel W. Mead.)

tified with the issues of this case and prior to April 3d, 1903, at least.

Mr. BLAKESLEE.—In this connection, our defenses relate to prior inventions, as well as anticipation and public knowledge.

A. I put in two other installations immediately following 1903. One for the Waterloo Water Company, which was owned by N. W. Harris & Company, bankers, of Chicago—owned or controlled by them. That installation was installed in 1904. Shortly after that—I can't give the date, although I can look it up for you if you desire—I installed a similar unit for the Green Bay Water Company of Green Bay, Wisconsin. Afterwards, the dates of which I can't give, a second unit was added to both plants.

Q. In what state was this Waterloo installation?

A. Waterloo, Iowa.

Q. Where was this Green Bay installation?

A. Green Bay, Wisconsin. [195]

Q. Prior to considering those installations, I show you another blue-print, marked at the bottom 2-E-83, and ask you if you know anything about it.

Mr. LYON.—That is objected to as leading and suggestive, calling for the conclusion of the witness, irrelevant and immaterial, and as too late to be material on the issues of this case.

A. This blue-print is a copy from a tracing made in my office of the original blue-print which was submitted to me by Byron Jackson—I believe for the Waterloo pump. I have the original of that, but can't spare it from my files, and I have certified on this that it is an exact copy. I can produce the orig-

(Deposition of Daniel W. Mead.)

inal for your examination if you wish.

Q. Was this tracing of this blue-print here before us made under your instructions? A. It was.

Objected to as leading and suggestive.

A. (Continued.) —and was checked up by me to see that it agreed with the original, and it contains a certificate in fact by the draughtsman who made it, and by myself.

Q. When was this blue-print and this tracing made?

Mr. LYON.—Objected to upon each of the grounds stated in the objection to the question asked the witness in regard to this blue-print.

A. Well, the tracing and blue-print was made in November 1919, of a blue-print received by me from Byron Jackson Machine Works in the summer of 1904.

Mr. BLAKESLEE.—We offer this blue-print last identified in evidence as Defendants' Exhibit "M-76," to wit, [196] this blue-print marked 2-E-83.

Mr. LYON.—Objected to as irrelevant, immaterial and incompetent, not the best evidence, no foundation laid for the introduction of secondary evidence; and all of the recitals upon such blue-print are each severally objected to as incompetent.

Subject to the objection made to the blue-print, a duplicate of such print marked Defendants' Exhibit "M-78" is attached to the return of this deposition in Case No. 485, with the same force and effect as though it were the blue-print produced here this morning and identified by the witness, but subject to all of the objections which are of record to the blue-

(Deposition of Daniel W. Mead.)

print so produced by the witness.

Q. What, if anything, did you have to do with the installation of this Waterloo Water Company pumping plant you have spoken of?

A. I advised the company to purchase one of the deep well centrifugal pumps from the Byron Jackson Machine Works. I am not sure whether I conducted the negotiations or not. But I saw it installed afterwards and saw it in operation, and afterwards advised the installation of a second unit of the same kind.

Q. Was that installation made, the second one?

A. It was.

Q. When did you see the first installation of the Waterloo company in operation?

A. Well, I could only tell you in a very general way that it was shortly after its installation. I think it was installed late in 1904 or early in 1905 and I saw it in operation there [197] at that time.

Q. What was the construction and organization of that pump installation?

A. It was in its general design almost identical with those installed at Lake Geneva, and at Milwaukee for the Pabst company.

Mr. LYON.—The answer is objected to as not responsive, as incompetent, as a mere conclusion of the witness and not a statement of fact.

Q. Do you know for what period of time this Waterloo installation was operated?

A. Why, to the best of my knowledge and belief it is still in operation.

Mr. LYON.—We move to strike the answer from

(Deposition of Daniel W. Mead.)

the record and exclude it from consideration upon the ground that it is incompetent, no foundation laid, and not proper evidence.

Q. Do you remember what the head of water was in that Waterloo installation?

A. I do not. I have the record in my office, because the well was bored under my direction, and in fact an estimate was made prior to the drilling of the well as to its necessary depth and the height to which the water would rise, etc. And I was there after it was drilled, to determine the conditions actually found and how nearly they substantiated my estimates. I can't recollect, however, the details as to where the water stood. I know we got about a million gallons per day from that well and that the pump was located below the surface about two hundred feet. [198]

Q. What was that water used for?

A. For domestic supply for the city of Waterloo.

Q. And from whom was the pump installation purchased?

A. Byron Jackson Machine Works, San Francisco.

Q. Of your own knowledge can you state whether there was any oil found present in the water delivered by the Waterloo installation?

Objected to as leading and suggestive.

A. I don't recall.

Q. Can you state what if any lubrication was provided for that Waterloo installation?

Mr. LYON.—Objected to as irrelevant and immaterial, subsequent to the date of the application.

A. Oil was used as a lubricant—was to be used as

(Deposition of Daniel W. Mead.)

a lubricant in the four pumps that I mentioned and as far as I know was so used.

Mr. LYON.—We move to strike the answer from the record on the ground that it is incompetent, no foundation laid, the witness not having qualified to answer the question, and as not responsive.

Q. How was that oil to be supplied and fed in those several four installations?

Mr. LYON.—Same objections.

A. To the best of my recollection it was simply inserted at the top of the shaft, allowed to flow down the shaft into the various bearings, and the residue finally found its way out through some form of stuffing-box at the bottom of the shaft.

Q. How was the oil finally disposed of after passing the stuffing-box?

Mr. LYON.—Same objections. [199]

A. Well, it came up in the discharged water.

Q. How about this Green Bay installation you have spoken of—when was that put in?

A. I would have to look that up and advise you, if it is necessary to know. I should say about 1905. I am not positive in regard to the date. I have the dates, however, at my office if it is essential.

Q. What did you have to do with that installation?

A. I redesigned and rebuilt the entire plant and installed this new water supply.

Q. Where did the pump mechanism come from?

A. The deep well pump mechanism was purchased from the Byron Jackson Machine Works.



(Deposition of Daniel W. Mead.)

Q. What, if anything, did you have to do with that?

A. Well, I arranged for the purchase and supervised the installation and tested it as to operation, and afterwards advised the company in regard to installation of a second unit of the same kind.

Q. Do you know whether that was purchased or not?

A. I know it was purchased; yes.

Q. Do you know whether it was installed or not?

A. I know it was installed.

Q. Now, as to this Green Bay installation and the Geneva Lake installation, what sort of pumping mechanisms were they, namely, the deep well mechanisms that you have mentioned?

Objected to as irrelevant and immaterial.

A. They were the deep well centrifugal pumps that we have been discussing; consisted of several pumps, one pumping into the other to give the required head, and in each of the first [200] installations in the four places mentioned they were driven by quarter-turned belts and by steam engines. The second pump Waterloo and the second pump Green Bay were driven by direct connected motors operated electrically at some distance away from the main pumping station.

Q. In what respects, if at all, did the Green Bay installation and the Geneva Lake installation compare with the Pabst and the Waterloo installations you have told us about?

Objected to as leading and suggestive, as incompetent, calling for the conclusion of the witness and

(Deposition of Daniel W. Mead.)

not for a statement of fact, not the proper method of proof, and not the best evidence.

A. They were all essentially the same, with minor improvements as experience demonstrated the necessity of such improvements. No material changes in general design. They were all quite similar.

Q. Please look among the miscellaneous blue-prints upon the floor and table here and see if you can locate any blue-print which in any way resembles the data which went through your hands in connection with this Waterloo installation.

A. I find one blue-print marked "Waterloo Water Company, Waterloo, Ind.," which I judge is really a print of the one at Waterloo, Iowa. I couldn't identify it, however. I am not at all certain whether I ever saw that particular print or not. It, however, is somewhat similar, except in greater detail, to the print 2-E-83, and it may or may not be. I wouldn't undertake to identify that particular drawing.

Q. What have you to say as to the disclosures in this drawing at the top of the main figure, in comparison with the [201] Waterloo installation?

Mr. LYON.—That is objected to as leading and suggestive, as incompetent, not the best evidence, not the proper method of proof, no foundation laid for the introduction of secondary evidence. Witness has already testified that he is not aware as to whether he has ever seen this print before or not.

A. Well, the general arrangement shown by this print which is numbered 1-C-131 is just the same

(Deposition of Daniel W. Mead.)

as in the print marked 2-E-83 as far as the conditions are disclosed by the two prints. In each case there is a 9-inch discharge pipe, and an interior pipe surrounding the shaft and separating the shaft from the discharged water.

I would like to make one correction in the statement I have just made, that the print 2-E-83 does not as far as I observe give the exact dimensions of the discharge pipe, but simply shows the general arrangements, which are similar, as far as arrangements go, to those shown on print 1-C-131.

I will have to make another change and state that on the print 2-E-83 is given a bill of material for the pipe, shafting, coupling and bearings, and that bill of material shows that the casing is 9 inches outside diameter, as shown on drawing 1-C-131; that they are using  $3\frac{1}{2}$  inch inside pipe, as shown on drawing 1-C-131, and contains other dimensions which are similar to those of the drawing 1-C-131; the outline on drawing 2-E-83 being too small to show these minor dimensions.

Mr. BLAKESLEE.—We offer in evidence the blue-print selected by the witness in his last answer, to wit, 1-C-131, [202] as Defendants' Exhibit "M-79" (and it is believed on comparison the same will be found to agree with the tracing similarly identified and in evidence as part of Defendants' Exhibit 6).

By Mr. LOFTUS.—A duplicate of said Exhibit "M-79" is attached as an exhibit to this deposition in Case No. 485 and offered in connection therewith.

(Deposition of Daniel W. Mead.)

(By Mr. BLAKESLEE.)

Q. I now hand you a group of letters and copies marked respectively Defendants' Exhibits "M-80" to "M-91," inclusive, purporting to be correspondence between yourself and Pabst Brewing Company, each bearing a date at its top, and will ask you if these are letters and copies of letters respectively received by and written by you at or within a day or two of the dates appearing at the tops thereof, between yourself and the Pabst Brewing Company, and if the same have been in your files since the dates of mailing and receipt respectively, and if you signed and mailed the originals of the copies of your letters among these letters, and received the other letters from the Pabst Brewing Company, and if they have all been in your files since substantially the dates of such letters and copies, the unsigned exhibits being the letters from you to the Pabst Brewing Company?

A. Yes.

It is stipulated that said correspondence, consisting of Defendants' Exhibits "M-80" to "M-91," inclusive, may be received in evidence and copied in the record, as follows: [203]

Letters, documents and papers identified by the witness this morning and referred to as Defendants' Exhibits "M-80" to "M-91," inclusive, are offered and received in evidence as so identified by such letter and number respectively and are copied in the records by stipulation as follows:

**Defendants' Exhibit "M-80."**

August 20th, 1903.

Pabst Brewing Co.,  
Milwaukee, Wis.

Gentlemen:—

I enclose herewith a letter just received from Byron Jackson Machine Works.

The telegram to which Mr. Jackson refers, was sent to my house, mailed to me at Fort Worth, and received Tuesday night just as I was taking the train for this place. I had left instructions at this office to forward any dispatches received directly to me, but as the dispatch contained no very definite information I have waited until arriving in Chicago, and find Mr. Jackson's letter explaining the same at hand.

You will note that Mr. Jackson asks that he be advised by wire if you will extend the time as suggested and will accept pump without the oiling and patent clause. Will you wire him direct, or do you prefer to advise me and have me do so?

Awaiting your instructions, I am,

Yours very truly, [204]

**Defendants' Exhibit "M-81."**

Milwaukee, Wis., June 18th, 1903.

Mr. Daniel W. Mead,  
First National Bank Bldg.,  
Chicago, Ill.

Dear Sir:

We have been trying to solve the objections which Mr. Jackson finds to the contract submitted to him

(Deposition of Daniel W. Mead.)

by us for the centrifugal pump and we believe that we have succeeded in everything with the exception of that part referring to the quantity of oil which is likely to get into the water from lubricating the bearings. Of course, it is utterly impossible for us to utilize water in which a certain amount of oil is contained and if Mr. Jackson feels confident that the amount will be so trifling in comparison with the large quantities of water he ought to be willing to send the pump subject to our acceptance. Mr. Jackson must appreciate the fact that we will not reject the pump if it is in any way possible for us to use it. We want water and will not stand in our way on account of an imaginary technicality.

The question of water in the well we would leave entirely to you or to two engineers, one to be appointed by Mr. Jackson and one by us, and if they wish, call in a third, or stand by the test of air pressure as you suggest. That should certainly be satisfactory to Mr. Jackson, our point only being that we do not want to accept for granted that there is no water in the well if his pump does not bring any up. We think our point on that score is well taken. [205]

The question of patent infringement suit we are willing to waive entirely. We have given the matter considerable thought and have come to the conclusion that possibly the only trouble could arise from your friend Mr. Hart, and as we have given him ample opportunity to demonstrate the feasibility of his patents, and of which Mr. Hart would not take advantage no doubt owing to the fact that his

device was not practicable, ought to put him out of the race altogether.

We have changed the contracts in accordance with the above and enclose you herewith a copy. In order to save time we have also sent one to Mr. Jackson, and suggest that it would be a good plan to have you write to Mr. Jackson in the premises.

Have wired Mr. Jackson today that we have mailed him the contracts.

Yours very truly,  
PABST BREWING COMPANY,  
G. G. PABST,  
Vice-president.

G. G. P./A. E. M.

**Defendants' Exhibit "M-82."**

Milwaukee, Wis., May 18, 1903.

Mr. Daniel W. Mead,  
Chicago, Ill.

Dear Sir:—

We confirm herewith our telegram of today as follows: "Fourteen inch dummy goes down two hundred feet. Are sending contracts. Wire Jackson."

We need not, we think, say anything further as to the [206] size of the hole for the Jackson Pump.

Referring to your letter of the 11th inst., with various enclosures and blue-prints, we wish to say that we cannot quite agree with Mr. Jackson, concerning the guarantee as to bearings and think that we can hardly be expected to pay this part of the expenses as it is included in the item of payment

which we agreed to in the contract. Of course Mr. Jackson must take it for granted that we will use every possible precaution to keep his installation in perfect running order, as it is necessarily to our interest to do so. He must, however, guarantee the wearing parts, satisfactory method of oiling, also that oil wastage into the water will be such that the water can be used for all necessary purposes; if not for brewing and boiler purposes, washing of kegs and so on which will not permit of any oil in the water, owing to the effect on our product.

However, all these points are duly covered in our contract two copies of which, in order to save time, we have today mailed to Mr. Jackson with the request to return one copy to us duly signed. We will send you a triplicate copy for your information.

Yours very truly,  
PABST BREWING COMPANY,  
G. G. PABST,  
Vice-president.

A. E. M. [207]

**Defendants' Exhibit "M-83."**

Milwaukee, Wis., Sept. 10th, 1903.

Mr. Daniel W. Mead,  
First National Bank Bldg.,  
Chicago, Ill.

Dear Sir:—

Kindly inform us whether you have had any word from Mr. Jackson concerning the centrifugal pump, which he has no doubt finished by this time.



We would like to have some information at the very earliest possible moment.

Yours very truly,  
PABST BREWING COMPANY,  
G. G. PABST,  
Vice-president.

**Defendants' Exhibit "M-84."**

Milwaukee, Wis., Aug. 3rd, 1903.

Mr. Daniel W. Mead,  
First National Bank Bldg.,  
Chicago, Ill.

Dear Sir:—

We received your letter several days ago in answer to our telegram as well as the copy of the letter from Mr. Jackson, a previous copy of which was already in our possession.

We have not as yet heard from Mr. Jackson, and desire to inform you that we are all ready for the pump. We have made [208] the air test and find water, and are now waiting anxiously for word from Mr. Jackson as to the outcome of his work.

We would like to have you inform us at your earliest convenience how matters stand and whether you have had word from Mr. Jackson lately.

Yours very truly,  
PABST BREWING COMPANY,  
G. G. PABST,  
Vice-president.

G. G. P./A. E. M.

**Defendants' Exhibit "M-85."**

July 9th, '3.

Pabst Brewing Co.,  
Milwaukee, Wis.

Gentlemen:

I am in receipt of a letter from Byron Jackson Machine Co. and inclose herewith copy of same.

In regard to the question of oil I would say that I do not think it is possible to build a centrifugal pump which will not deliver some oil to the water.

The amount of oil can be so limited as to be unobjectionable for municipal purposes but whether or not it would effect the water for your art or not I of course cannot say. I think this oil can all be trapped off at the surface if found too great for your purpose by keeping a constant head in the reservoir and drawing the water for use from the bottom. The pumps Jackson has furnished here are doing very good work and I think will prove very successful.

Very truly,  
DANIEL W. MEAD. [209]

**Defendants' Exhibit "M-86."**

June 4th, 1903.

Mr. G. G. Pabst, Vice-pres.,  
Pabst Brewing Co.,  
Milwaukee, Wis.

Dear Sir:—

Your favor of May 18th, confirming despatch of even date and enclosing copy of proposed contract sent to Jackson, was duly received, and I wired

Jackson at once, as I believe I advised you before.

I am also in receipt of a letter from Jackson, dated May 23rd, enclosing copy of a letter sent to you commenting on contract.

I returned from a two weeks trip last night, and find that a recent letter from you was forwarded to me at Danville, Illinois, so that I have just missed it. I presume this covers the same matter. Without, therefore, seeing this letter, I would make the following comments on Jackson's letter of May 23rd.

In regard to the question of oil in water, I would say that no centrifugal pump can be built and properly lubricated without at least a small portion of oil going into the water. Where the plant is handling large quantities of water, this usually is so small as not to have any effect, at least on ordinary domestic water supply. If the complete absence of oil is essential, I do not think you can use a centrifugal pump in the well.

In regard to Jackson's second point, regarding the supply of water, it seems to me that a specification, which [210] would be both satisfactory to yourselves and to him, can be drawn up. I have found that the best way of measuring the elevation of water in a deep well is by placing a small pipe,—usually  $\frac{1}{4}$ " down the well and below the inlet to the pump. By putting a gauge on top and using an ordinary hand air pump, air pressure can be raised in this pipe sufficient to force the water from the bottom of the gauge pipe. Knowing the length of gauge pipe, the pressure will indicate accurately, (at least within one or two per cent), the head of

water. As, of course, the gauge can be read before and after beginning to pump, this makes an accurate measure, which it seems to me should be satisfactory to both parties. The specification covering this method would obviate the terms "satisfactorily demonstrated," which seems to be the point to which Jackson objects.

In regard to the third point raised, I would say that this seems to be a business proposition which apparently must be settled between Jackson and yourselves. I have a complete file of the patents on centrifugal pumps, and know of no patents which could be interfered with. The use of a Series centrifugal pump is old, and cannot be patented by anyone, neither can the use of a centrifugal pump in a small well be patented. The only patents apparently possible, are the minor details of construction, and I believe the proposed features of the Jackson pump are quite different from anything that has been yet designed. Whether they are patentable or not, I am, of course, unable to say.

I trust some contract can be written which will be satisfactory to all parties, as I have great faith in Jackson's ability to accomplish the results we desire.

Yours very truly, [211]

**Defendants' Exhibit "M-87."**

Milwaukee, Wis., April 11th, 1903.

Mr. Daniel W. Mead,  
First National Bank Bldg.,  
Chicago, Ill.

Dear Sir:

Both of our pumps have again gone back on us owing to breaking of rods, foot valves, and a few minor ailments. Do you think it possible to get from Jackson one or two equipments in time to install our present wells. We should like to know about this immediately in order to properly repair and install the old equipment again, should Jackson not make immediate deliveries.

Yours very truly,  
PABST BREWING COMPANY.  
G. G. PABST,  
Vice-President.

**Defendants' Exhibit "M-88."**

April 15th, 1903.

Mr. G. G. Pabst, Vice-Pres.,  
Pabst Brewing Co.,  
Milwaukee, Wis.

Dear Sir:

As you requested by telephone, I enclose herewith copy of telegram sent to Byron Jackson Machine Works, and the original [212] of the answer received from them.

The letter to which he refers has, of course, not been received as yet. Will forward same to you as soon as received. Yours very truly,

**Defendants' Exhibit "M-89."**

Milwaukee, Wis., April 16th, 1903.

Mr. Daniel W. Mead,

First National Bank Bldg.,

Chicago, Ill.

Dear Sir:

We return you herewith your letter and telegram from Mr. Jackson and wish to confirm our telegram of today as follows:

"Offer twenty-five hundred for pump installed complete by Jackson's representative subject to ninety days successful operation."

Possibly with a little urging on your part and holding out to Mr. Jackson the prospects of installing three or four more pumps he would shorten the time of delivery considerable.

Kindly send us copy of letter when received from Mr. Jackson.

Yours very truly,

PABST BREWING COMPANY.

G. G. PABST,

Vice-President.

G. G. P/A. E. M. [213]

**Defendants' Exhibit "M-90."**

April 22nd, 1903.

Mr. G. G. Pabst, Vice-Pres.,

Pabst Brewing Co.,

Milwaukee, Wis.

Dear Sir:

Enclosed please find two letters and a telegram recently received from Byron Jackson Machine Works.

I will forward to you the letter and contract mentioned in the dispatch as soon as received.

Yours very truly,

**Defendants' Exhibit "M-91."**

Milwaukee, Wis., May 11th, 1903.

Mr. Daniel W. Mead,

First National Bank Bldg.,

Chicago, Ill.

Dear Sir:

We enclose herewith blue print which is self explanatory. The notation on the side of the blue print shows that we had a twelve inch pipe, with couplings of  $13\frac{1}{2}$ " outside diameter, down to a depth of 200 feet. By increasing the diameter to  $14\frac{1}{4}$ " with rings the pipe went down to 180 feet only.

We have given a copy of this blue print to Mr. W. H. Gray for his information.

We would suggest that you forward the copy of the blue print to Mr. Jackson so that he may fully understand the [214] *condi-* under which he will have to put down the pump.

Yours very truly,

PABST BREWING COMPANY.

G. G. PABST,

Vice-President.

G. G. P./A. E. M. [215]

Examination adjourned until 2 P. M.

2 o'clock P. M.

Direct examination of the witness resumed by Mr. Blakeslee.

(Deposition of Daniel W. Mead.)

Q. You have put before us in connection with your recollection of the Byron Jackson matter two further blue-prints. Will you please state what these are?

A. These blue-prints Nos. 1-D-14 and 3-B-41 are blue-prints furnished me by the Byron Jackson Machine Works and show a 4-inch turbine pump designed and installed to fit in a 10-inch casing well. This pump was described to me by Mr. Byron Jackson in one of his earliest communications in regard to the feasibility of centrifugal pumps for deep well work, and these blue-prints were, as nearly as I can now recall, furnished me in about 1902 in the course of our correspondence or in connection with my interview with Mr. Jackson in California.

Q. At the time these two last produced prints were put before you, did you understand the showing and contents thereof?

A. Yes, after they were received and I examined them.

Q. Now, referring to the blue-print 3-B-41, please state what is depicted in the view at the right hand of that print.

A. The view at the right hand shows the shaft coupling that was supposed to be used on this pump.

Q. And with the coupling what, if anything?

A. Small pieces of the shaft inserted in the coupling.

Q. How does that coupling and shaft ends in exact structure compare with the shaft couplings and building up of the shafting of the pumps in the Pabst, Waterloo and other Byron [216] Jackson



(Deposition of Daniel W. Mead.)

pump installations you have told us about?

Mr. LYON.—That is objected to as incompetent, not the best evidence, the exhibits speaking for themselves, and as leading and suggestive.

A. Well, I couldn't answer that, only by comparison with the drawings, because I don't recollect the details clearly enough to know how nearly identical these later pumps were with this 1900 pump of Mr. Jackson's.

Q. Refer, please, to Defendants' Exhibit "M-76" (3-C-74) and compare any structure you find therein which stands comparison with this shaft coupling construction shown in this print 3-B-41.

Mr. LYON.—Objected to on the grounds stated in the objection to the preceding question; on the further ground that this witness, the leave to take his deposition was in regard to facts and not as an expert, and that no leave has been granted to take expert testimony in this case, and the matter if not clear from the drawings or blue-prints themselves could only be subject matter of expert testimony.

Mr. BLAKESLEE.—We call counsel's attention to the fact that the stipulation providing for the taking of the testimony of this witness is not limited to fact testimony, although that has been the main burden of his testimony today.

Mr. LYON.—The representation of your motion was that you wished this as fact testimony.

Mr. BLAKESLEE.—The stipulation speaks for itself. [217]

A. The two drawings 3-B-41 and 3-C-74 each show a shaft coupling . 3-C-74 shows a coupling

(Deposition of Daniel W. Mead.)

into which the shaft of a uniform size screws from each end, and apparently held in place by the setting up of the threads into a more or less conical female thread of the coupling. On the other hand, the coupling in 3-B-41, as nearly as I can make out, shows no thread whatever on the lower connection. The lower connection is apparently held in place partially by a key or feather and partially by two rivets. The lower shaft also differs somewhat from the upper shaft, which apparently is held in the coupling by a screw at the lower end of the upper shaft, which screws into a narrow or contracted area near the center of the coupling, and the upper shaft shows no indication of a key or of rivets.

Q. With respect to the two shaft ends introduced within the coupling in print 3-B-41, what would the structure you have described there permit with respect to the union of these shaft ends?

Mr. LYON.—Same objections.

A. Well, the shaft ends abut each other apparently in drawing 3-B-41, and the construction in both the upper and lower connection is such as to permit rotation without separation of the shaft from the coupling.

Q. And how with respect to the end to end relation? A. Well, they are shown as abutting.

Q. And how with respect to lengthwise movement?

Mr. LYON.—Same objection to all these questions.

A. They permit no lengthwise movement in 3-B-41, as they abut.

(Deposition of Daniel W. Mead.)

In 3-C-74 there is a space shown which would permit of [218] endwise movement only, provided the threads were sufficiently loose to permit the further tightening up of the threads.

Q. What do you take it to be the function or purpose of the key or feather on the lower shaft end in print 3-B-41?

A. To force the rotation of the shaft through the mechanical connection with the shaft above, which I would assume is attached to a motor.

Q. And if the threads were disconnected and the lower shaft end dropped down somewhat in the coupling, what would result as to the condition in there and operation of the lower shaft end?

Mr. LYON.—Same objections.

A. If the threads were disconnected there would be no attachment to the upper shaft which would permit of the rotation of the coupling.

Q. How about the feather or key?

A. Apparently there is no key shown in the upper shaft. The only attachment is through the thread.

Q. And there is no independent connection?

A. None shown.

Q. Referring now to the print 1-D-14, have you any observations to make as to what that shows?

Mr. LYON.—Same objections.

A. That print, namely, 1-D-14, is a drawing somewhat in detail showing a section through the 4-inch turbine pump and shows the relation of the suction and discharge passages and the connection with the suction pipe below and the discharge pipe above and with the shaft, from which the pump is

(Deposition of Daniel W. Mead.)

driven from the mechanical contrivance near the surface. [219]

Q. Prior to seeing these two prints which we are discussing, had you ever seen a pump or representation of one of centrifugal type for use in small bored wells?

A. I believe, in fact I am certain that the drawing Defendants' Exhibit "M-6," also shown as 1-C-75, of the Byron Jackson Machine Works, was furnished me by Mr. Jackson prior to the time that he sent prints 3-B-41 and 1-D-14; and he also sent a second blue-print or sketch, of which I have no copy, which showed a series centrifugal pump connected by two discharge pipes with the surface.

Q. Those here that you testified about?

A. These were sent to me prior to the receipt of the drawings of the 4-inch turbine pump.

Q. The one with the two pipes is the one you have testified about before?      A. Yes.

The defendants offer in evidence the two prints just discussed, namely: 1-D-14 as Defendants' Exhibit "M-92," and 3-B-41 as Defendants' Exhibit "M-93."

It is stipulated that the notary may have photostat copies made of these prints, to be substituted, with the full force and effect as the originals therefor, and copies of such photostats are to be sent to the solicitor for plaintiff and to solicitor for defendants in both of the patent cases, and the original prints delivered back to Mr. Mead.

Q. Referring again to blue-print 3-E-22, namely, Defendants' Exhibit "M-75," I will ask you to

(Deposition of Daniel W. Mead.)

please state whether at the time you received this blue-print you understood its showing and disclosure. [220]      A. I did.

Q. Will you please point out therein, particularly with relation to the large vertical sectional view at the right hand side of the print, the several parts and features shown at the bottom thereof.

Mr. LYON.—That's objected to as irrelevant and immaterial, as being subsequent to the date of filing of the Layne application for the patent in suit; as indefinite and uncertain, the witness not having fixed even approximately the date when he first saw the blue-print referred to; and as incompetent, not the best evidence, the print speaking for itself, no foundation laid for the introduction of secondary evidence.

Mr. BLAKESLEE.—We stand upon our several defenses in this case, as before pointed out.

A. The section referred to, this lower portion, shows a discharge pipe screwed into a flange connected with the discharge ell and pulley-frame used to operate the pump. The drawing also shows a shaft about  $2\frac{1}{4}$  inches in diameter running downward from the pulley-frame through a 4-inch casing which separates the shaft from the discharge waters from the pumps below. The 4-inch casing together with the 9-inch casing afford an annular space through which the discharge waters pass from the pumps without contact with the shaft. The whole construction is shown setting over a 15-inch well casing, and is the construction utilized in the case of the original Pabst pump and essentially the same as

(Deposition of Daniel W. Mead.)

was used in the other pumps first installed at Lake Geneva and Waterloo and Green Bay. [221]

Q. At the time you received this print or one like it, that you have told us about, what did you understand these parts surrounding the shaft just above the discharge elbow to be?

Mr. LYON.—Same objections.

A. They were packing rings and packing spaces used to prevent the discharge of water along the shaft and to keep the 4-inch casing clear from water at the upper end of the 4-inch casing.

Q. And how in respect to any grit, sand or matter in suspension in the water, or solid content?

Mr. LYON.—Same objection and as leading and suggestive.

A. Well, necessarily if it would keep the water away it would also keep everything that is in the water away from the shaft and away especially from the bearings of the shaft.

(By Mr. LOFTUS.)

Q. Mr. Mead, can you state whether or not it was the custom of the Byron Jackson Machine Works to affix an order number to all drawings pertaining to each job?

Mr. LYON.—That's objected to as leading and suggestive, and upon the further ground that it is incompetent, no foundation laid, the witness not qualified to answer the question.

A. My recollection was that they had an order number with each job. I can't say that it was customary, only to the extent of my own personal

(Deposition of Daniel W. Mead.)

experience with them. They did a great deal of work for other people.

Q. Can you ascertain from data or blue-prints appearing here in evidence what was the order number of the first Pabst installation? [222]

Mr. LYON.—Same objection as last noted, as assuming facts not testified to by the witness: that such Pabst installation had any order number, and upon the further ground that the exhibits speak for themselves.

A. The Pabst pump had an order number, E. 1896-5108.

Q. Referring again to Defendants' Exhibit "M-44," namely, the copy of the Byron Jackson letter of April 29th, 1903, to you, can you state whether or not the blue-print Defendants' Exhibit "M-75" is identical with one of the blue-prints or drawings received by you in connection with said letter?

Objected to as leading and suggestive and as having already been answered by the witness, as incompetent, no foundation laid, calling for the conclusion of the witness, and not the best evidence.

A. Well, I do not note any drawing number on here, and I should only feel that that was one of the drawings received at this time through the date on the drawing of April 25th, 1903, at which time Mr. Jackson had expected to furnish me all of the drawings of the pump, and he failed to do that, and sent a few drawings with this letter, one of which he stated had just been received, and that was the drawing as I recall it that was dated April 28th. I

(Deposition of Daniel W. Mead.)

presume this of April 25th was also included, but I wouldn't want to state that as an absolute fact.

Mr. LYON.—We move to strike the answer from the record and exclude it from consideration upon each of the grounds stated in the objection, and upon the further ground that it is apparent that it is only the reasoning, deduction and opinion of the witness, a mere argumentative answer, and [223] not a statement either of recollection or of fact.

Q. Do you recall whether or not there was more than one drawing received at the time you received the letter Defendants' Exhibit "M-44"?

Mr. LYON.—Same objections as last noted.

A. On further perusing the letter I find that he mentions "Discharge head and pulley-frame." I would say in that connection that to the best of my knowledge and belief I have that drawing in my office that was received at that time. I think so from the fact that he states here, "I did not think it necessary to show this in section." This drawing "M-75" does show it in section, whereas the drawing that I have in my office does not show it in section. I can produce that one that I have in my office if desired. I didn't think it was of any importance, but it lies right there in my office now.

(By Mr. BLAKESLEE.)

Q. When was that received by you, the one that's at your office?

A. Well, I think from this letter that that was undoubtedly received at this time and that this other one was forwarded later, when he got me to go into more detail.



(Deposition of Daniel W. Mead.)

Q. Do you know of the existence or location of a concern known as the Northern Electric Manufacturing Company?

A. There used to be such a concern here. I don't know whether it exists yet under that name or not.

Q. Did you ever have anything to do with it in connection with pumps?

A. No. There was a pump of this general description installed [224] and in operation here in the city water works, but I haven't any idea whether Jackson furnished it or whether it was the American Well Works of Aurora. I think they did furnish one, and they had an old Woods pump here for a while.

Q. When did you see such a pump as that in the city water works here?

A. Well, we took a pump of that sort out during this last year—had it taken out. They are using air here now.

Q. Displacement pumps?

A. No; with air lift.

Q. I show you a further blue-print marked 1-E-71 and ask you if you have ever seen such a print as that before?

Objected to as leading and suggestive.

A. Yes, I recognize that as one of the detailed drawings furnished of the Pabst pump, showing an enlargement of one of the single units of the series pump.

Q. When did you see such a print as that first?

A. The nearest I could locate it was some time during 1903, prior to the installation of the pump.

(Deposition of Daniel W. Mead.)

I couldn't say just what date.

Q. At the time you saw the print like this did you understand its disclosures? A. Why, yes.

Q. What did you then understand to be the part designated in the center of this view on this blue-print "Turned oil ring"?

Mr. LYON.—That's objected to as irrelevant, immaterial and incompetent, and too late to have any bearing upon the issues of this case.

Mr. BLAKESLEE.—We wish to point out again that our [225] defense is that we have never used such a thing as attempted to be shown in the Layne patent in suit, nor has anybody else, but that we are utilizing substantially the Byron Jackson invention as developed in our proof.

A. I understood by the term "turned oil ring" that that was a groove turned in the bearing metal at the lower end of the shaft in order to admit lubrication through a pipe from the surface.

Q. From whom did you receive the blue-print which you say you received in 1903, like this print last discussed?

A. From the Byron Jackson Machine Works.

Mr. BLAKESLEE.—We offer in evidence this blue-print last discussed, namely, 1-71, as Defendants' Exhibit "M-94."

Mr. LYON.—Objected to as irrelevant, immaterial and incompetent; no foundation laid.

Q. As to any of these pumps you have told us about, of the Byron Jackson deep well enclosed shaft type, including the Waterloo, Green Bay, Geneva Lake and Pabst pumps—if the same were

(Deposition of Daniel W. Mead.)

visited now and were found running or installed, would it be possible, from your knowledge, to visually inspect and explore the shafting and enclosing casing, bearings and lubrication system of the same.

Objected to as leading and suggestive.

A. I think it would be wholly impracticable. I doubt if the owners or users would permit such an examination, as they are essential features of the water works system and could not be shut down for examination without serious jeopardy to the interests of the water companies or of the cities [226] owning them and such an examination probably wouldn't be permitted. Of course I can't speak authoritatively on that, except from my own knowledge of their use.

Q. After the installation of the first Pabst Brewing Company Byron Jackson pump construction at Milwaukee, concerning which you have testified, why did you continue to specify these Byron Jackson small bore deep well pump installations for other companies and interests?

A. Well, they constituted the best available means to get a large quantity of water out of these smaller wells with the least first cost of installation and the smallest operating expense to anything that was then available.

Q. Please mention again which of these four installations included in the last question you personally saw in operation after installation?

A. Well, I saw the Waterloo pump a number of times and the Green Bay pump numerous times, the last time being last summer.

(Deposition of Daniel W. Mead.)

Q. The same pump that was first installed there?  
Objected to as leading and suggestive.

A. Yes and no. The upper portion, drop pipe, shafting, etc., were the same, but during last year they had purchased new pump parts; that is, the series pumps, had taken out the old ones and had substituted the new ones during last year. The old ones had worked up to last year: about fifteen years—or fourteen years.

Q. By pump parts do you mean the propellers, etc.?  
A. Propellers and casings.

Objected to as leading.

At this point a messenger has just produced a [227] blue-print sent for by the witness, and upon inspection thereof the witness states as follows:

The WITNESS.—The blue-print just received is not the blue-print received by me from the Byron Jackson Machine Works in 1903, but was a print received at a later date and for a different purpose.

Q. Then have you any further drawing at your office or in your files such as you spoke of a few moments ago?  
A. No, I have not.

Q. Please state within your knowledge how many installations you have seen, or of your own knowledge have known of, since 1902, of the enclosed shaft type, such as you have discussed in your testimony in describing and discussing the Waterloo, Green Bay, Geneva Lake and Pabst installations?

Mr. LYON.—That is objected to as leading and suggestive and also as confusing, there being material differences so far as the issue of this case is concerned between the particular installations re-

(Deposition of Daniel W. Mead.)

ferred to in the question; and as calling for the conclusion of the witness, incompetent, not the best evidence, no foundation laid for the introduction of secondary evidence, not the proper method of proof.

Q. Do you understand the question? A. Yes.

Q. Then please answer.

Mr. LYON.—Same objection.

A. There were nine installations made in connection with the four places mentioned. I also know that the Schlitz Brewing Company of Milwaukee later installed one or more units of [228] this same type. I also heard of a variety of others, but the location and date of installation are not sufficiently clear in my mind to be able to make any definite statements concerning them.

Q. Did you have anything to do with the ordering, consulting or engineering incident to the Schlitz installation you have spoken of?

A. My recollection is that I advised Mr. Schlitz—not Mr. Schlitz, Mr. Uihlein, who represents the Schlitz estate, concerning the installation of one of the pumps, but I took no active part in ordering it, nor have I any recollection of ever seeing it in. I was informed that it was put in and worked satisfactorily.

Mr. LYON.—We move to strike all the testimony of this witness in regard to the Schlitz installations from the record and exclude it from consideration, on the ground that it is incompetent hearsay, of which the witness has no personal knowledge.

(Deposition of Daniel W. Mead.)

Q. What Schlitz company was this and where located, please?

A. I believe the name is the Schlitz Brewing Company, located at Milwaukee, Wisconsin, and they were people who were my clients and for whom I installed a pumping plant of about twelve million gallons a day capacity.

Q. And in advising them to install such Byron Jackson enclosed shaft pump, did you or did you not make any reference to the prior installation which you have told us about that was made for the Pabst Brewing Company of the same town?

Objected to as leading and suggestive and assuming facts not testified to by the witness. [229]

A. It was through their knowledge of the Pabst installation that they first conceived the idea of installing this unit for themselves, and on account of the success of the Pabst installation that they did order and install a unit for their own brewery.

Q. Do you or do you not know whether they used the water developed and delivered by the Schlitz installation for such purposes as the water delivered by the Pabst installation was used?

Objected to as leading and suggestive.

A. I don't know what their use was.

Q. What, Professor, is your view as a hydraulic engineer as to the practicability and feasibility of using the waters developed from the geological formations you have told us about underlying the surface strata in Wisconsin, Iowa, Minnesota and Illinois, to wit, using such water for lubrication of pump bearings and shaft bearings.

(Deposition of Daniel W. Mead.)

Mr. LYON.—That is objected to as irrelevant and immaterial and as calling for the conclusion of the witness, having no bearing upon the issues of this case, and as being an attempt to take alleged expert testimony, which is not within the motion of the defendants in E-42, or of the order of the special master, nor has there been any order in either of these cases permitting the taking of a deposition of an expert.

A. The use of water for lubricating bearings in such pumps has not been found satisfactory within my knowledge.

Q. What is the nature of that water developed in the territories which I have mentioned, with respect to its mineral or other content or matter in suspension? [230]

Mr. LYON.—Same objections as last noted.

A. Most of the water is fairly highly mineralized, containing considerable quantity of bicarbonates of magnesia and lime and some of the similar substances in solution, which, when approaching the surface and therefore relieved of the pressure of superincumbent water lose a certain quantity of free carbonic acid gas and thereby drop a certain amount of the bicarbonates that are held in solution only through the presence of a carbonic acid gas. These wells also frequently carry considerable quantities of sand when pumping at a high rate, on account of the water entering through the sandstone disintegrating the sandstone and the velocities of water being sufficient to sustain the sand and to bear it to the surface.

(Deposition of Daniel W. Mead.)

Q. From the standpoint of efficiency and operativeness and general practicability, please make a brief statement as to your engineering opinion and knowledge of the performance of enclosed shaft small bored well pumps, centrifugal pumps, and accompanying features, as furnished by the Byron Jackson Machine Works and installed in the many wells you have told us about.

Mr. LYON.--Same objection as last noted on the record. The further objection is urged that it is not apparent from the question what is meant by an enclosed shaft in the question, as the same does not refer to the several installations to the same thing, nor embody the issue in this case.

A. The pumps of the general character used by the Pabst Brewing Company, the Lake Geneva Water Company, the Waterloo Water Company, and the Green Bay Water Company have proved fairly efficient and economical in operation, and sufficiently flexible in their character to make them very satisfactory and desirable for the smaller communities, where a sufficient [231] quantity of water can be obtained by the use of one or two of such installations. I have not found such installations very satisfactory for larger communities, where numerous units had to be installed, and where in consequence the installation of such numerous units complicated the waterworks system and added to the expense of operation and maintenance.

Q. But for the purposes and usages for which they are intended and adapted and in which you have known them to operate, what have you to say



(Deposition of Daniel W. Mead.)

as to their practicability, dependability, feasibility and general efficiency?

A. They have been very satisfactory in the four places I have mentioned, and some of the places of which I know.

Cross-examination by Mr. LYON.

Q. Did you ever at any time see this first Pabst pump which was furnished to the Pabst Brewing Company?

A. I don't recall definitely ever having seen it, either before or after installation. I think I may have seen it after it was installed, but I wouldn't say.

Q. If you did, how long after it was installed was it that you saw it?

A. I think very soon after. I have been in Milwaukee more or less and would naturally through curiosity have gone to see it, but I can't remember definitely the date or the facts.

Q. You are sure that installation gave perfect satisfaction?

A. No, I know it did not give perfect satisfaction.

Q. Are you aware that changes were made in it?

A. Yes, I was told so by the engineer, that they had some trouble with the bearings and some trouble concerning the oil, but I never knew the nature of those. [232] I was advised that they had changed the bearings.

Q. You say the engineer; you mean Mr. W. Clasmann? A. Yes, I mean Mr. Clasmann.

Q. You mean the Mr. W. Clasmann who appeared here yesterday morning?

(Deposition of Daniel W. Mead.)

A. Yes, whom I met here yesterday morning.

Mr. BLAKESLEE.—We object to the implication that Mr. Clasmann appeared here, unless counsel means that he physically was present here.

Mr. LYON.—I mean that he was physically present here, Mr. Blakeslee, and at your request, and that you interviewed him for the alleged purpose of taking his deposition, and adjourned the proceedings of yesterday for that purpose, and then did not take his deposition. I wanted to identify Mr. Clasmann as the same man that the witness was referring to as the engineer, so that there would be no mistake as to that.

Mr. BLAKESLEE.—Mr. Clasmann was here yesterday in this city. We have never seen him before. We did talk with him, and we considered calling him as a witness. He stated that he was in town likewise at the request of plaintiff, and that ended the matter as far as we are concerned.

Mr. LYON.—As to whether he stated that he was in town at the request of plaintiff or not, I have no knowledge and no opportunity of knowledge; but will state on the record that no one on behalf of the plaintiff ever requested Mr. Clasmann to appear here or anywhere else, and that his appearance here was, according to counsel's [233] statement, on behalf of the defendants.

Mr. BLAKESLEE.—Counsel should be sworn if he wishes to testify further about this. If he wishes to produce Mr. Clasmann, he can do so. That is his affair.

Q. You say, Mr. Mead, that Mr. Clasmann stated

(Deposition of Daniel W. Mead.)

to you that they had some trouble with the bearings on this first Pabst pump installation. Do you remember what he said in regard to the trouble with those bearings?

Mr. BLAKESLEE.—We object to the question on the ground that on its face it can only call for hearsay and not the best evidence, not the proper method of proof, not cross-examination.

A. No, I do not recall that he went into any detail in regard to the trouble. It was simply mentioned incidentally to me when Mr. Clasmann was in my office a good many years after this installation was put in. I was then inquiring whether the installation was still in operation and what efficiency had been obtained, if any test had been made. He had a little handbook in his pocket, from which he gave me information about an efficiency test that he said he had made, and incidentally said they had had some trouble with the bearings; and I believe mentioned some trouble with oil, which was very objectionable in the brewing business. Mr. Clasmann at that time had left the Pabst company and was in business for himself and we were talking about something which had occurred a considerable while before and didn't discuss it in any great detail. I was after general information. He said the pump was still running the last he had known of it.

Mr. BLAKESLEE.—We move to strike out the answer [234] to the last question on the grounds of the objection and each thereof.

Q. Did Mr. Clasmann in that interview tell you that they had removed the tube or casing that sur-

(Deposition of Daniel W. Mead.)

rounded the drive shaft and the bearings?

Mr. BLAKESLEE.—The same objection as last noted.

A. He did not. I wasn't aware that they had done so. If that's the fact I don't know it, either by information from him or from any other source.

Q. You don't know, then, whether that surrounding casing and bearings were removed from that installation, do you?

A. I judged from what he said that the bearings had been removed, and some different form or some modification of the original bearings had been substituted. But to the best of my knowledge he never mentioned to me anything about the removal of the interior pipe.

Q. When was it according to your best recollection, Mr. Mead, that you had this conversation with Mr. Clasmann?

A. I should think it was about 1916 or 1917.

Q. And where?

A. At my former office, 530 State Street.

Q. In the city of Chicago, Illinois?

A. In the city of Madison, Wisconsin.

Q. About what time of the year, do you remember?

Mr. BLAKESLEE.—We object as immaterial.

A. I haven't any idea about that.

Mr. BLAKESLEE.—Objected to on the ground that it is immaterial on the ground of each of the objections last urged. [235]

A. I haven't any idea in regard to the date. Mr. Clasmann, who was selling certain boiler equip-

(Deposition of Daniel W. Mead.)

ment, came into my office to see if we were in the market for anything of that sort, and as a matter of fact I didn't recollect him at first, his face was familiar and he introduced himself to me, and recalled the fact that I had been in contact with him in connection with the Pabst installation, and then I remembered him very clearly. It was that introduction that made me ask about this installation, which I hadn't seen for years, if I had ever seen it. I think I have seen the thing, but I don't recall any date.

Q. Then, if I understand you correctly, this interview that you had with Mr. Clasmann, and to which you have been referring, was the first time that you had seen him after the Pabst installation, was it?

Mr. BLAKESLEE.—Same objections.

A. Well, I wouldn't want to say that. I might possibly have seen him within a year or so after, but this was the first time I had seen him after the machines had been in long use; and my inquiries were directed more to ascertain how satisfactory the machines had been, both as to the efficiency, if a test had been made, and the longevity of the installation as a pumping installation.

Q. You were first called for consultation with the Pabst Brewing Company with regard to this particular well in which this first Byron Jackson installation was made in the fore part of 1903, weren't you?

A. That's my recollection. My letters and correspondence will show that.

(Deposition of Daniel W. Mead.)

Q. Your file that you let me look through shows a report under [236] date of April 22d, 1903. Was that your report after having been so called in for consultation in regard to the pumping apparatus for this well?

A. This was a report made as indicated on April 22d, and was the result of my first views of the situation.

Q. And the date of that report is April 22d, 1903? A. It is.

Q. I believe that you testified that you were in San Francisco the last two days of May and the first few days of June, 1902, and at the plant of the Byron Jackson Machine Works. Is that correct?

A. It is.

Q. When did you next see Mr. Byron Jackson?

A. I don't recall.

Q. Did you see him at any time between that date, the first part of June, 1902, and this first Pabst installation?

A. I don't think so, I think our connections were entirely by correspondence.

Q. Mr. Mead, are you prepared to state positively that Defendants' Exhibit "M-92" and "M-93," the blue-prints which you produced here marked 1-D-14 and 3-B-41, were not delivered to you by Mr. Jackson while you were at San Francisco the last two days of May or the first few days of June, 1902? A. No, I couldn't state.

Q. Then so far as your present recollection enables you to state, these two prints last identified, might have been handed to you by Mr. Jackson

(Deposition of Daniel W. Mead.)

while you were then in San Francisco?

A. Possibly so.

Q. Did Mr. Jackson show you that pump while you were there that [237] time—or do you remember?

Mr. BLAKESLEE.—We object to that as misleading and indefinite. There is no pump before us here.

Q. When I say “that pump” I mean the pump corresponding to these two prints just identified.

A. I don’t recall that he did. I don’t think I ever saw it. I wouldn’t say positively that I never did, but I have no recollection of it. I think I would have remembered it if it had been shown to me. I have seen so many installations in San Francisco of one kind and another that it is asking too much of my memory to ask me to that extent.

Redirect Examination by Mr. BLAKESLEE.

Q. Now, Professor, what was the occasion of Mr. Byron Jackson sending you the blue-print which is Defendants’ Exhibit “M-6” and the letter accompanying same?

Mr. LYON.—That is objected to as not redirect examination.

A. They were sent to me in reply to my inquiry as to whether it was practicable to build a deep well centrifugal pump that would raise the water from deep wells for waterworks purposes, and whether Mr. Jackson would undertake to build such pump for any plant that I might advise such construction.

Mr. LOFTUS.—Q. What is the purpose of this

(Deposition of Daniel W. Mead.)

report of April 22d, 1903, which counsel for plaintiff showed you?

A. About six or seven years prior to my visit to Milwaukee I had built a shaft and tunnel system for the city of Rockford, [238] developing a considerable quantity of artesian water. In our discussion of the general waterworks conditions at or near the plant of the Pabst Brewing Company, the Rockford installation was mentioned, and the question was raised as to whether or not it might be a method which the Pabst people could utilize for developing water supply. This is a preliminary report making a general estimate, not on detailed plans, showing a somewhat large cost of construction. It was not a plan which was recommended, but simply a plan which was considered as one of the possible methods of developing a supply. This was my report to Mr. Pabst and the project was dropped, as I recall it, after this report.

Q. Did that report or the subject matter of that report have anything to do with the wells in which the Byron Jackson pumps were installed?

A. No, nothing whatever.

Q. Prior to the date of this report had you been consulted by the Pabst Brewing Company?

A. I had been in Milwaukee on March 17th and had consulted with Mr. Pabst on that date. This letter is dated April 22d, 1903, and is therefore nearly a month after my consultation with Mr. Pabst.

Q. Prior to that time had you been consulted by them on other matters aside from artesian wells?



(Deposition of Daniel W. Mead.)

A. No, I had never met Mr. Pabst until March 17th. I might add that I really went there at that time, not at the request of Mr. Pabst, but at the request of Mr. Gray who had a contract. Mr. Gray introduced me to Mr. Pabst, and Mr. Pabst finally [239] asked me to act for him in connection with the development of water supply.

Recross-examination by Mr. LYON.

Q. Do I understand you to say, Mr. Mead, that prior to March 17th you had never met Mr. Pabst?

A. That is the best of my recollection. Now, I simply drew that conclusion from the statement here in this letter that in company with Mr. William Gray I visited Milwaukee on March 17th. I might have been up there before that date, but I suppose the correspondence there would disclose the fact. I can't remember those dates.

Q. You have no recollection of Mr. Pabst calling upon you at your office prior to March 17th, 1903?

A. I don't now recall that Mr. Pabst was ever in my office. He might have been there a dozen times, but I don't remember.

Q. I show you a letter from your file, on the letter-head of the Pabst Brewing Company and signed G. G. Pabst, dated February 19th, 1903, in which he asks you to state the time when it would be convenient to meet at your office, and ask you if that refreshes your recollection at all.

A. No, this don't refresh my recollection at all, except that it shows that I was in communication with Mr. Pabst in February, and I can't recall now that he ever came to my office. This apparently

(Deposition of Daniel W. Mead.)

asks whether it would be more convenient for me to come to Milwaukee or for their representative to call. My recollection would be that Mr. Pabst never was in my office. Now, I am not positive of that.

Q. I show you a letter dated February 24th, 1903, from Mr. Pabst. Please read that and state whether after reading this letter [240] of his to you of that date, to the effect that accompanied by their mechanical engineer he would reach your office about eleven o'clock Thursday morning, whether it refreshes your recollection.

A. No, it don't. I should assume from this letter that he came, but I don't remember. I haven't the faintest recollection of his ever being in my office.

Q. Isn't it a fact, Mr. Mead, that except as these matters that have been inquired about here are of record in blue-prints and letters and documents, you haven't a distinct recollection of all of the details?

Mr. BLAKESLEE.—We object to that question as calling for a conclusion as to the weight of the testimony, putting an arbitrary *omnibus* interpretation upon the testimony of the witness, not calling for a statement of facts, attempting to short-cut cross-examination by a single question, and not the proper method of proof, not cross-examination, incompetent, irrelevant and immaterial.

A. I would like to answer that fully and tell you just exactly, if I may. I think that is true when you say "all of the details." But I have a very distinct recollection concerning the general features of this pump, because the pump was built at my

(Deposition of Daniel W. Mead.)

request and in accordance with my suggestion, and was the first pump of the kind that I ever know of being installed, and I was very much impressed with the value of that kind of pump, and it left a very clear impression on me of the general outline of that pump. Now, as far as dimensions and all these things that constitute details are concerned, I confess that they are hazy. As I have said, I don't [241] remember all these dimensions, but as to the arrangement of discharge pipes, and of enclosed shafts, and the arrangement in general for separating the shaft from the discharged water, and to permit of the oiling of the interior bearings and keeping the water away from them—those matters were impressed on me very, very distinctly by my study of the situation and my conversations and correspondence with Mr. Jackson. I believe I could swear to those as long as I live, because it was the first pump of the kind and I was very much interested in it, not only as an engineer, but as a development in the line of pumping machinery in which I was greatly interested.

Q. You mean this first Pabst installation pump was the first one of the kind?

A. As far as my knowledge goes, yes—of a series pump, you understand.

Q. The enclosed line shaft feature and bearings and so forth that you have referred to?

A. Yes, the first one I had ever seen. I couldn't say; there might have been a hundred of them made somewhere else.

Deposition closed.

DANIEL W. MEAD. [242]

Mr. LOFTUS.—Notice is hereby given counsel for plaintiff that we shall proceed to Chicago, pursuant to notice heretofore given, and take the deposition of Mr. John W. Alvord, beginning at two P. M., Wednesday, February 11th, at the office of C. J. Loftus, 14th floor, Marquette Building. [243]

State of Wisconsin,  
County of Dane,—ss.

I, Arnold R. Petersen, a notary public within and for the county of Dane and State of Wisconsin, commissioned and sworn according to law, do hereby certify that the foregoing deposition of Daniel W. Mead was taken before me in the above-entitled suit as in the foregoing record thereof set forth; that said deposition was commenced at 10 o'clock A. M. on February 9th, 1920, at the office of Burr W. Jones, Esq., in the Badger Block in the city of Madison, county of Dane, State of Wisconsin; that the parties to said suit were represented by counsel as in the foregoing record set forth; that the taking of the deposition was continued as in said record set forth; that said record contains a true and correct statement of all proceedings had and taken during the taking of said deposition; that said witness Daniel W. Mead, was by me duly sworn according to law to testify the truth, the whole truth and nothing but the truth in said cause; that pursuant to the stipulation of counsel for the respective parties the said deposition and the proceedings thereon were taken correctly in shorthand by Edward H. Smith and by him reduced to type-

writing, under my supervision and direction; that the said record contains a truthful and correct statement of all questions asked, answers given by the witness, and objections and proceedings had during the taking of said deposition; that said witness duly signed the said deposition in my presence after reading over the same; that the various exhibits offered in evidence and not copied in the record pursuant to the stipulation of counsel are forwarded herewith and made a part of this deposition, having [244] been identified by the titles indicated in the foregoing record of said deposition. That I am not interested, directly or indirectly, in the subject matter of said suit, nor a party thereto, nor connected by blood or marriage with any of the parties to said litigation.

Dated February 18, 1920.

[Seal]

ARNOLD R. PETERSEN,  
Notary Public, Dane County, Wisconsin. [245]

State of Wisconsin,  
Dane County,—ss.

I, Herbert F. Hansen, Clerk of the Circuit Court in and for the County of Dane and State of Wisconsin, aforesaid, the same being a court of record having a seal, do hereby certify that Arnold R. Petersen, Esquire, and by and before whom the foregoing deposition was taken, was at that date thereof a notary public within and for said state, residing in said county, duly commissioned and qualified, and authorized by the laws of said State of Wisconsin to take and certify such depositions and to take and certify the acknowledgment of proofs of deed therein; and that the same is in due

form of law and is taken in accordance with the laws of the State of Wisconsin. I further certify that I am well acquainted with the handwriting of said notary public and verily believe his signature to the foregoing to be genuine.

In Testimony Whereof, I have hereunto set my hand and affixed the seal of said court, at Madison, Wis., this 19th day of February, A. D. 1920.

[Seal]

HERBERT F. HANSEN,

Clerk. [246]

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(Title of Court and Cause.)

**Notice of Taking Deposition.**

To Plaintiff Above Named and to Frederick S. and Leonard S. Lyon and Wm. K. White, Its Attorneys:

Please take notice that the defendants herein will take the testimony of D. W. Mead, State Journal Bldg., Madison, Wisconsin; William Clasman, 120 Wisconsin St., Milwaukee, Wisconsin, and possibly others; and J. W. Alvord, of Chicago, Illinois, and possibly others, each and all of whom reside more than one hundred (100) miles from the place of trial herein and more than one hundred (100) miles from any place at which the District Court of the United States for the Northern District of California is appointed to be held by law, for use at the final hearing on behalf of the defendants; the testimony of the said D. W. Mead before F. M. Wylie, Esq., a notary public in and for the county of Dane, in the city of Madison, State of Wisconsin, who is not of counsel nor interested in this cause, at the

office of said D. W. Mead, State Journal Bldg., in said city, beginning at 10 o'clock A. M., February 9th, 1920, and thereafter from day to day as the taking of the deposition may be adjourned.

At the conclusion of the taking of said deposition of said D. W. Mead I shall proceed, by ordinary means of travel, to Milwaukee, Wisconsin, and thereafter proceed to take the deposition of said William Clasman, and possibly others, before the Clerk of the United States District Court for the Eastern District of Wisconsin at the office of the said Clerk in said County of Milwaukee, in the city of Milwaukee, State of Wisconsin.

At the conclusion of the taking of said deposition or depositions of said William Clasman and others I shall proceed, by ordinary means of travel, to Chicago and there take the [247] deposition of the said J. W. Alvord, before I. V. Curran, a notary public in and for the county of Cook, in the city of Chicago, State of Illinois, who is not of counsel nor interested in this cause, at the offices of Parkinson & Lane, Marquette Bldg., in said city of Chicago; and such depositions will be so taken in accordance with the provisions of Sections 863, 864 and 865 of the Revised Statutes of the United States and the Equity Rules; said depositions being taken concurrently with the taking of like depositions in a cause copending in the United States District Court for the Southern District of California, of this same plaintiff against the American Well & Prospecting Company et al., and taken at such time and in such manner, and in such order, that the testimony deduced by said depositions on behalf of these de-

defendants shall coincide with the manner and time of procedure in the examination by the said defendants in the said American Well and Prospecting Company's suit.

You are invited to appear and cross-examine.

CHAS. E. TOWNSEND,

CHAS. M. FRYER,

WM. A. LOFTUS,

Attorneys for Defendants.

Dated January 29th, 1920.

Receipt of copy of the within notice of taking testimony admitted this 29th day of January, A. D. 1920; reserving objections that *same indefinite*, unreasonable and not in compliance with New Equity Rules and all other objections.

F. S. LYON and

W. K. WHITE,

For Plaintiff.

[Endorsed]: Filed Feb. 25, 1920. W. B. Maling, Clerk. By J. A. Schaertzer, Deputy Clerk. [248]

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In the Southern Division of the United States District Court for the Northern District of California, Second Division.

EQUITY—No. 485.

INFRINGEMENT OF LETTERS PAT. 821,653.  
LAYNE & BOWLER CORPORATION, a Corporation,

Plaintiff,

vs.

WESTERN WELLS WORKS, INC., a Corporation et al.,

Defendants.



**Deposition of William Clasmann, for Plaintiff.**

Deposition of William Clasmann, taken in the above-entitled suit on behalf of the plaintiff, pursuant to the attached notice, commencing at the hour of ten o'clock in the forenoon, on Saturday, February 21st, 1920, at the office of William Clasmann, Room 620 Wells Building, in the city of Milwaukee, county of Milwaukee and State of Wisconsin, before W. Schultz, a notary public in and for Milwaukee county, State of Wisconsin.

Present: FREDERICK S. LYON, Esq., on Behalf  
of the Plaintiff.

WM. A. LOFTUS, represented by CLAR-  
ENCE J. LOFTUS, Esq., Appearing  
for the Defendant.

Whereupon the following proceedings, were had:

Mr. LOFTUS.—The taking of the deposition of William Clasmann in this case is objected to for want of proper notice, for the further reason that the notice was served or attempted to be served while counsel was attending on a hearing, taking depositions in this case, and for the further reason that it is being taken without the order of the master. [249]

WILLIAM CLASMANN, being first duly sworn according to law, testifies as follows:

Direct Examination by Mr. LYON.

Q. Your name is William Clasmann?

A. William Clasmann.

Q. You reside at Milwaukee, Wisconsin?

A. 686—51st Street.

(Deposition of William Clasmann.)

Q. What is your business, Mr. Clasmann?

A. At the present time I am manufacturers' agent, selling conveying machinery, furnace work, and so forth.

Q. Approximately how old are you?

A. Fifty-five years.

Q. At any time in the past were you connected with the Pabst Brewing Company of Milwaukee, Wisconsin?

A. I was connected with the Pabst Brewing Company somewhere around 12 years.

Q. In what capacity?

A. In the capacity as chief engineer.

Q. I show you a paper and ask you if you have ever seen it before?

(Document handed to witness and examined by him.)

A. This is a telegram I received some time ago, which is addressed to me and signed Charles E. Townsend.

Q. About when was it that you received that telegram?

A. First part of February; it is dated the 5th of February. [250]

Q. This year?      A. This year.

Q. Upon receipt of that telegram, did you make any response thereto in any manner?

A. I did not respond to this telegram; that is, I did not know whether I could comply with the wishes of the people at the time and before I got my mind made up Mr. Jones from Madison, of Jones & Schubring, telephoned long distance and asked me

(Deposition of William Clasmann.)

to appear in Madison on Monday—I forgot the date—two weeks ago I guess it was.

Q. The 9th? A. Yes.

Q. Monday, the 9th of February this year?

A. Yes, that is correct.

Q. Whom did you meet at that time?

A. I went into the office of Jones & Schubring at somewhere around 9 or 10 o'clock in the morning and I met Mr. Blakesly, met Mr. Lyon and met Mr. Jones and the agreement was made that I should—my testimony should be taken at 2 o'clock in the afternoon.

Q. Was there another gentleman there with Mr. Blakesly?

A. There was another gentleman there with Mr. Blakesly. I believe it was Mr. Loftus.

Mr. LOFTUS.—I move to strike out the answer [251] as immaterial; it has no bearing on the issues in the case and in the Los Angeles case it is certainly not rebuttal.

Mr. LYON.—Q. Before 2 o'clock of February 9th, 1920, did you have any talk with Mr. Raymond Ives Blakeslee or Mr. William A. Loftus?

A. Mr. Blakeslee and Mr. Loftus—I did not remember the names—the name “Loftus” has come—the name “Loftus” I do not remember but I presume that was the gentleman and the other gentleman I said, they invited me to lunch to have a little talk with me.

Q. And did you go to lunch with them and have a talk with them?

A. I did go to lunch with them at the Park Hotel.

(Deposition of William Clasmann.)

Mr. LOFTUS.—I make the same objection to this testimony.

Mr. LYON.—Q. And what was discussed during that luncheon?

Mr. LOFTUS.—That is objected to as immaterial and having no bearing on the issues here.

A. During that luncheon Mr. Blakeslee went over the proposition and asked me what I knew about this particular case and what success we had with the pumps in question. [252]

Mr. LYON.—Q. What pumps do you mean?

A. The Jackson pumps that were operated at the Pabst Brewing Company.

Q. Did you make any statement during that conversation as to what you knew?

Mr. LOFTUS.—Objected to as irrelevant, calling for hearsay and having no bearing on the issues here.

A. Yes, I made a statement—clear statement of all I knew about that, as far as he asked me.

Mr. LYON.—Q. What did you tell him?

A. I told him—

Mr. LOFTUS.—I make the same objection to that testimony.

A. I told him that we bought and installed a pump from Jackson and we operated it under a guarantee and that the pump broke down before the time of guarantee was over and that the trouble of this breakdown was caused by poor construction of the inner casing which was supporting the shaft bearings.

Mr. LOFTUS.—I move to strike out the answer.

(Deposition of William Clasmann.)

Mr. LYON.—Q. Subsequent to that conversation were you called upon [253] to testify at Madison?

Mr. LOFTUS.—Enter the same objection for us.

A. I was called upon to testify by the telegram that was just shown here and by Mr. Jones over the telephone.

Mr. LYON.—Q. Well, was there anything said in that conversation at luncheon between Mr. Blakeslee and yourself in regard to your testifying in that case at that time?

A. I told Mr. Blakeslee at the time that the Layne & Boller people had been after me and had gone over the case with me and that very likely they would have me to testify also.

Q. Did Mr. Blakeslee say anything in regard to your testifying in that case on behalf of his client at that time?

A. Mr. Blakeslee told me after he listened to my story that they did not want this testimony.

Q. Is that all he said?

A. And he told me that I might just as well take the next train and go home. I then told him that the other side would very likely want to put me on the stand and that they would take the testimony or get the testimony in some sort of way later and they might just as well submit to it now. Mr. Blakeslee then told me that he would not do that; that they would take their testimony [254] first and that there would not be any time and so on, and that he would not put me on the stand for the simple reason that it made a difference whether I was called by them or by the other party.

(Deposition of William Clasmann.)

Mr. LOFTUS.—I move to strike out the answer as irrelevant, immaterial and largely hearsay.

Mr. LYON.—Q. Did either Mr. Blakeslee, Mr. Loftus or anyone else pay or offer to pay your expense on that trip over to Madison or was there any conversation at this luncheon or on that day in regard thereto?

Mr. LOFTUS.—I enter the same objection.

A. Mr. Blakeslee told me if I would not testify for the other party they would pay the expense. If I was to testify for the other party then the other party could pay the expense of coming over there. I told him I did not care who paid the expenses or whether they were paid; that all I was after was my time; I wanted to get through and get away.

Mr. LYON.—Q. Have you any interest of any kind in the subject matter of this suit or are you interested in any manner with any of the parties to this litigation?

A. Not a particle to neither. [255]

Q. Have you any feeling of favoritism or prejudice for or against any of the parties?

A. I have no prejudice. All I want is to state the truth and give the Court and both parties the benefit of what I know.

Mr. LYON.—The telegram identified by the witness is offered in evidence and marked "Plaintiff's Exhibit, Clasmann Exhibit No. 1."

Mr. LOFTUS.—It is objected to as immaterial, as having no bearing on the issues involved, and in the Los Angeles case certainly not rebuttal.

(Deposition of William Clasmann.)

Document received and marked "Plaintiff's Exhibit, Clasmann Exhibit No. 1."

Mr. LYON.—Q. You have referred to a Byron Jackson pump or pumps which was installed by the Pabst Brewing Company. Was that while you were engineer for the Pabst Brewing Company?

A. Yes, the pumps were contracted and installed during the time I was engineer for the Pabst Brewing Company.

Q. When was the first of these pumps installed?

A. The first of the pumps was installed during 1903.

Q. At what time of the year?

A. Late in the year.

Q. Please tell us whether any representative of the Byron [256] Jackson Machine Works was present at the Pabst Brewing Company during such installation?

A. There was an engineer sent out from the Byron Jackson Works; I believe his name was Robb. The records and correspondence will verify whether I am right there or not. I believe it was Robb.

Q. Did you meet him?

A. Yes, I met him and in fact he worked with me or worked under my directions to some extent.

Q. Now, will you tell us—please give me a statement of the facts in connection with the installation of the first Byron Jackson Machine Works pump for the Pabst Brewing Company, telling me approximately when the installation was finished and what tests, if any, were made of the pump and how it operated as to efficiency, and so forth and

(Deposition of William Clasmann.)

what was its subsequent history?

Mr. LOFTUS.—Objected to as calling for a conclusion of the witness.

A. The pump was installed late in the year 1903; I do not remember dates; and was started up in either late 1903 or early in 1904; it was cold, and snow on the ground at the time when we began to run. The pump was a success from the start from all appearances; produced the guaranteed amount of water and operated well within the limits of efficiency guaranteed by Byron Jackson. The [257] objection at first to the water was that the pump brought up a lot of oil; this oil was the result of the lubrication of the shaft bearings driving the pump and for a while we pumped this water right in the yard running down the gutter of Chestnut Street in a sewer. The Byron Jackson Company was under a guarantee to operate this pump successfully, I believe it was for three months. While the oil bothered us, we had no means of eliminating it nor could we ask Jackson to run without it. We intended to run through our three months, and if it was successful to pay for the installation. The pump broke down after the biggest part of this test period had elapsed. I do not exactly remember what time was still left to finish the test run. And the pump was pulled out and we found that the inner casing supporting the shaft bearings had caused the trouble by shaking loose from its fastenings and breaking up, also breaking the shaft. The pump proper was in "A-1" condition. It was now a question of accepting or rejecting the installation,



(Deposition of William Clasmann.)

and, talking this thing over, we concluded that we could make the pump work, or, in other words, make the shafting from the ground down to the pump proper stand up some way or another. We concluded to accept the pump and relieve Jackson from further responsibility; but we feared that Jackson would [258] charge us an enormous price for additional pumps because, as far as we could see, they lost money on this installation. We asked for quotation on two more pumps, telling them that the acceptance of the first installation—

Mr. LOFTUS.—Just a moment. Are any of these things you are testifying about in writing,—when you asked for quotations, etc.?

A. How is that?

Mr. LOFTUS.—Were those asked for in writing,—those quotations,—any letters?

A. Most of that was done by wire.

Mr. LOFTUS.—Were these wires or letters sent out by you or by the Pabsts?

A. By the Pabst Brewing Company.

Mr. LOFTUS.—Which one of the Pabsts?

A. At the direction of Mr. Gustav Pabst.

Mr. LOFTUS.—I move to strike out all the testimony of this witness as not being the best evidence. That is all evidence relating to what was said and done by the Pabst Brewing Company relating to the purchase of this pump and the additional ones.

Mr. LYON.—(Addressing reporter.) Will you read the witness' last testimony so he can go on?

[259]

(Deposition of William Clasmann.)

(Testimony re-read by reporter. Witness continues:)

A. We asked for quotation on two more pumps, telling them that the acceptance of the first installation would depend upon the price of the additional pumps. This was an inquiry for pumps only. Shafting and discharge pipe we intended to furnish ourselves. The price quoted was satisfactory. The installation was paid for and the two new pumps ordered. The first of the two new pumps that we installed we used heavier inside tubing and tried to make this thing set up. Now, on the first pump—on the first installation, as soon as Jackson's man was off the ground, or perhaps during the time that he was there—I don't remember—we proceeded to use water for lubricant, so we could use the water pumped. The inner casing kept on giving us considerable trouble and the pumps had to be pulled out frequently. The second pump, in spite of the heavier inside tubing and the fact that we used flange couplings on the pipes, also gave us continuous trouble and it was some time between May and August of 1904 that we abandoned the inner casing entirely, used for discharge pipe lengths of eight feet long or about eight feet with a spider holding a bearing in between each pipe coupling. This arrangement worked satisfactory [260] and we have been able to after that to keep pumps down from one to three years.

Q. In this last arrangement, Mr. Clasmann, were the bearings open to the water being pumped?

A. In this last arrangement the bearings were

(Deposition of William Clasmann.)

open to the water of the well or the water being pumped lubricated the bearings.

Q. How did you use the water lubrication with this first Byron Jackson installation?

A. We used water lubrication the same as oil,—the same as Jackson used oil lubrication, with the only difference that we used more of it. We arranged a little filter and run city water through there from the top down.

Q. Can you produce any drawings or blue-prints which were made substantially at the time that you made these changes that you have referred to in these Byron Jackson pumps at the Pabst Brewing Company?

A. (Indicating.) There is a bunch of drawing laying right on the desk there, gentlemen, that might give us—throw some light on the subject.

Q. Will you take these several blue-prints, taking each one, and as you refer to it I will identify it, and tell us what they are and when they were made and so forth? [261]

A. Here is one blue-print dated May 9th, 1902, showing a dummy—

Mr. LOFTUS.—Were these made by you?

A. These blue-prints were taken off drawings which are on file at the Pabst Brewing Company.

Mr. LYON.—Q. Made at the time of the date?

A. The drawing has been made at the time. As you see, the dates are on the different ones.

Mr. LOFTUS.—Did you make the drawings?

A. The drawings were made under my direction. I did not make any drawings myself. They were

(Deposition of William Clasmann.)

made by men that worked in my department.

Mr. LYON.—Now, this first one you say was of a dummy?

A. The first one shows a dummy to measure the hole in the well.

Q. What was the purpose of the dummy?

A. To see that the well was in proper shape to receive the pump.

Mr. LYON.—This blue-print is offered in evidence, to be marked "Plaintiff's Exhibit Clasmann Exhibit No. 2."

Mr. LOFTUS.—That is objected to as immaterial and not properly identified and not rebuttal in the Los Angeles case. [262]

(Document marked "Plaintiff's Exhibit, Clasmann Exhibit No. 2.")

A. (Witness continues:) Now, here is a blue-print dated May 5th, 1904, copied—the tracing where this is made from is from Jackson's blue-print, as marked on here (indicating).

Mr. LOFTUS.—I move to strike that part of the answer as a mere conclusion of the witness.

Mr. LYON.—Q. By whom was this tracing from which this blue-print was produced, made?

A. It was made by one of my men in the office of the Pabst Brewing Company.

Q. Did you have anything to do with the making of it?

A. I did not personally make this drawing or copy this tracing, but it was made under my direction.

(Deposition of William Clasmann.)

Q. Do you know whether or *not* is a true production?

Mr. LOFTUS.—Objected to as calling for a conclusion.

A. To the best of my knowledge, yes, it is true.

Mr. LYON.—Q. And what is this—as showing—

A. This shows the Jackson pump with the flange discharge pipe instead of screw discharge pipe.  
[263]

Q. I hand you a red lead pencil and ask you to mark the part that you have referred to in this drawing as “flange” with a red line and if you refer to any other parts, also mark them in red. Proceed.

A. Well, this here shows plainly the arrangement at the time, of supporting the inner casing and the bearings; if that is not material, very well and good. I don’t know whether it is or not.

Q. That is the view at the upper left-hand corner of the blue-print where you marked it in red?

A. Yes.

Mr. LYON.—This print is offered in evidence as “Plaintiff’s Exhibit, Clasmann Exhibit No. 3.”

Mr. LOFTUS.—Object to the offer. The print has not been properly proven or identified, and as not being rebuttal in the Los Angeles case.

(Document marked “Plaintiff’s Exhibit, Clasmann Exhibit No. 3.”)

Mr. LYON.—Q. To what installation does this print refer? Explain its connection with these Byron Jackson Pabst Brewing Company pumps.

Mr. LOFTUS.—Objected to as calling for a conclusion. Witness has already admitted he did not

(Deposition of William Clasmann.)

make the drawing or print or compare it with the supposed original. [264]

A. This is the layout or the proposition for the further installation—or the second and third installation.

Mr. LYON.—Q. I notice on this print (referring to Clasmann Exhibit No. 3) at the top (reading): “Advise sleeve coupling rather than flange coupling to provide for imperfect linement of well casing.” Do you know what that refers to?

A. That refers to this coupling (indicating), the sleeve coupling instead of flange coupling.

Q. Which you previously marked in red?

A. Which I had previously marked with red, yes. Now, this was our idea of construction, and there is Jackson’s suggestion.

Q. Now, please tell us what this next print in your pile is.

Mr. LOFTUS.—Objected to as calling for a conclusion of the witness, no foundation having been laid.

Mr. LYON.—When it was produced, and what it is?

Mr. LOFTUS.—And, further, that it is immaterial.

A. Now, this print here, dated May, 1904, shows the coupling constructed by us for holding these pipes together—the discharge pipes. You can see here that this coupling was bolted—was screwed on the pipe, as marked there. [265]

Mr. LYON.—Q. Marked “B” and “A” in red?

(Deposition of William Clasmann.)

A. "A," and that there was rivets put through there.

Q. Marked with "B"?

A. To get an absolutely rigid condition. That is the method that we used on the flanging.

Q. Of what pumps?

A. Of the second and third installation, pump number 3 and number 2.

Q. And when was this drawing made?

A. This drawing was made according to this, 1904.

Mr. LOFTUS.—I make the same objection; calling for a conclusion.

Mr. LYON.—Q. Did you have any knowledge of the making of this drawing?

A. It was made under my direction.

Q. At the time?

A. At the time, by one of the men under my supervision.

Q. With regard to the showing of this drawing, state how it compares or differs with the installation as you actually made it?

Mr. LOFTUS.—Objected to as calling for a conclusion of the witness.

A. To the best of my knowledge we installed pipes with couplings just exactly like this is. [266]

Mr. LYON.—Q. In what pump?

A. Pump No. 3, or well No. 3—generally—in order to give you a better idea, I think I better state that the first installation was made on deep well No. 4, and the second installation was made on deep well No. 3, and the third installation was made on deep well No. 2.

(Deposition of William Clasmann.)

Mr. LYON.—The print last referred to by the witness is offered in evidence as Plaintiff's Exhibit, Clasmann Exhibit No. 3.

Mr. LOFTUS.—This is objected to as not properly proven or identified.

(Document marked "Plaintiff's Exhibit, Clasmann Exhibit No. 3.")

Mr. LYON.—Q. Proceed, Mr. Clasmann, with these prints you produced and tell us when the prints were made, by whom, under whose direction, and for what and what they represent in connection with these Byron Jackson Pabst Brewing pumps?

A. Now, here is two blue-prints. One is dated July 14th, 1904, and another one without a date, both showing the final change of construction and showing the inserted spider as previously stated.

Q. The first of these, which I will ask to have marked [267] for identification, Plaintiff's Exhibit, Clasmann Exhibit No. 5—explain to us what that shows.

(Document marked "Plaintiff's Exhibit, Clasmann Exhibit No. 5.")

A. This shows the spider construction. You see there is a cast-iron ring which goes upon the flanges which shows on this other blue-print.

Q. Which is marked for identification "Plaintiff's Exhibit, Clasmann Exhibit No. 6." Proceed.

(Document marked "Plaintiff's Exhibit, Clasmann Exhibit No. 6.")

A. And three ribs running from this outer ring to the center which holds two bearings. Between the



(Deposition of William Clasmann.)

outer ring and the bearing in the center there is sufficient space left for the water to pass through. The bearing itself on this drawing is marked "Babbitt." We later used a bronze bushing which is in use to-day yet.

Q. By whom was this drawing exhibit 5 made?

A. This drawing, exhibit 5, was made by one of my draftsmen at my instruction.

Q. Who designed what is therein shown?

A. I, personally.

Q. On the right-hand view there are two concentric circles. What do these represent?

A. The inner circle represents the bearing material which is marked "Babbitt" here and later on changed to bronze. [268]

Q. What does the drawing at the right-hand side of exhibit 5, inside of the inner circle represent?

A. It represents the opening in the bearing in which the shaft—the pump shaft operated.

Q. Then when this was installed in those pumps, the shaft went through this central bearing you have identified? A. Yes.

Q. And what was between such shaft and the outer wall casing or the delivery discharge pipe of the wall? A. There was nothing in between.

Q. Now, which ones of the three Byron Jackson machine works pumps of deep wells 4, 3, and 2, was this installation put into?

A. This installation as it is shown here was put into pump three and two and later to two more, of which I do not remember the number now.

(Deposition of William Clasmann.)

Q. Was this particular installation put into well No. 4?

A. The spider as shown on this drawing—

Q. (Interrupting.) Exhibit 5.

A. (Continuing.) —was used on deep well No. 4, as well, but the flange construction was made different on deep well No. 4. On deep well No. 4, we used the original 9-inch casing furnished by Jackson with the first installation and had cast-iron flanges brazed on, giving the same construction with the only difference [269] that there was no riveting and no screwing.

Q. The drawing from which blue-print exhibit 6 was taken, by whom and under whose instructions was it made?

A. It was made under my instructions by one of my draftsmen.

Q. And approximately when?

A. Undoubtedly at the same time when this drawing was made.

Q. Exhibit 5. Now, do exhibit 5 and exhibit 6 correctly illustrate the constructions?

Mr. LOFTUS.—Objected to as grossly leading.

Mr. LYON.—Withdrawn.

Q. How do the showings of Plaintiff's Exhibit, Clasmann Exhibits 5 and 6, differ or correspond with the installations of wells 4, 3 and 2 as finally installed by the Pabst Brewing Company?

Mr. LOFTUS.—Objected to as calling for a conclusion of the witness and immaterial.

A. The drawing shows exactly how the installation is made on well 3, 2 and two other wells, and

(Deposition of William Clasmann.)

different for No. 4 well in so far that the flange is brazed on insteal of screwed and riveted.

Mr. LYON.—We offer in evidence the two prints produced by the witness and which have been marked for identification “Plaintiff’s Exhibit, Clasmann Exhibit 5 and 6, respectively.”

Mr. LOFTUS.—Objected to as not properly [270] proven or identified and furthermore as not being the best evidence, the witness having admitted that the tracings are in existence.

Mr. LYON.—Q. Now, referring back to the original installation of Byron Jackson pumps on deep well No. 4 for the Pabst Brewing Company as installed by Mr. Robb, you have referred to an inner casing in that installation—

A. (Interrupting.) Referred to what?

Q. Referred to an inner casing in that installation and to certain bearings in that installation. Please again state, and a little more in detail, just what difficulties you had with that inner casing and those bearings as thus installed by Mr. Robb.

A. The inner casing would shake itself loose; it would break apart where it was screwed together and finally the shafts would break. It would also shake the outer casing loose to some extent, that is, loose enough so it would slightly leak and would interfere with the pump running as soon as the lineament was lost, the shaft would begin to shatter and throw our belt off.

Mr. LYON.—You may crossexamine. [271]

Cross-examination by Mr. LOFTUS.

Q. When did you make up the blue-print you re-

(Deposition of William Clasmann.)

ferred to in your direct examination?

A. These blue-prints?

Q. Yes, these particular ones.

A. You mean when they were printed from the tracings?

Q. Yes.      A. Last week.

Q. Where are the tracings?

A. The tracings are at the Pabst Brewing Company.

Q. Are they there now?      A. They are there now.

Mr. LOFTUS.—I move to strike out all the testimony referring to blue-prints, for the reason that they are not the best evidence. The tracings are admittedly available.

Q. How long did you run the first pump, Byron Jackson pump, using oil for lubrication?

A. About somewhere around two months, to the best of my memory.

Q. During that time the pump worked satisfactory, so far as operation of the pump was concerned—so far as pumping water, but as I understand, the oil got into the water and you were using that water for washing beer kegs—      A. Intended to use it—

Q. And this oil had a tendency to cling or adhere to the inside of the kegs and it was not a very desirable [272] addition to the beer; is that it?

A. That is about it, but we never used that water,—the water was never actually used, that had oil in it.

Q. Well, that is what happened, that is the reason you discontinued the use of the oil as a lubricant?

A. Yes.

Q. So long as you used the oil, it worked all right?

(Deposition of William Clasmann.)

A. No, it did not work all right.

Q. But it operated for two months?

A. It operated for two months and broke down.

Q. While you were using oil, it operated for two months?

A. While we were using oil it operated for two months, yes.

Q. Now, after you discontinued the use of oil you used water as a lubricant, and this water you used was city water?     A. Yes.

Q. Which, of course, is sandy and gritty—at least it was at that time?

A. It was not sandy and gritty, because we filtered it.

Q. Well, you tried to filter it, but still it contained considerable sand and grit?

A. It did not contain any sand or grit. The water was actually fit for water lubrication in the shape we used it for lubrication.

Q. Sandy and gritty water will cut out the bearings?

A. Sandy and gritty water will cut out the bearings; yes.

Q. Well, there is not any question about that and this city water, it is well known by anyone having anything to do [273] with it, it is sandy and gritty, not so much now as it was in the early years, 1902, 1903 and 1904, in the early years considered by those that tested it, that it was sandy and gritty.

A. I know quite a little about city water of those years, that is not a fact—city water was good for lu-

(Deposition of William Clasmann.)

bricating purposes in those days, especially after being filtered.

Q. I suppose if it was fit, that is why you filtered it?

A. To make absolutely sure that you would not get anything deleterious out of it or anything—that is the reason it was filtered.

Q. What kind of a filter did you use?

A. I believe we used a sponge filter.

Q. Are you certain about that?

A. Well, I don't know how certain—I am pretty positive—it is a long time to remember it absolutely.

Q. Do you remember where you bought that filter?

A. That filter was made right there.

Q. Do you know who made it?

A. It was made in the shop under my direction.

Q. Do you know who made it?     A. The foreman.

Q. Answer my question,—who made it?

A. The man who made it?

Q. Yes.     A. I cannot remember. [274]

Q. Do you know when he made it?

A. He made it at the time that that pump was used.

Q. 1905?

A. No, that was somewhere around 1904.

Q. He made it the latter part of 1904?

A. He made it the first part of 1904.

Q. Do you remember who made it?

A. I don't remember who made it.

Q. Where did he make it?

A. Made it right on the premises.

Q. As a matter of fact, you bought it already made, didn't you?     A. No, didn't buy it ready made.

(Deposition of William Clasmann.)

Q. How was this filter made?

A. The filter was made—a tubing—or casing, two heads on and filled with sponges.

Q. What kind of sponges?

A. Sponges such as you use for washing—same sponges you use for washing automobiles or something similar.

Q. Do you know a man by the name of Jessrang, Peter?     A. Jessrang—yes.

Q. Was he employed by the Pabst Brewing Company during the years 1902, 1903 and 1904?

A. Yes, foreman of one of the machine-shops.

Q. Did he have anything to do with this thing you spoke about?

A. Yes, he made practically—practically all this work was [275] done in his shop, or by his men.

Q. Now, when you were looking up this situation a week or so ago, did you find any correspondence in the files of the Pabst Brewing Company?

A. I did not look for correspondence.

Q. Did you find any memorandums—

A. Did not look for any memorandums at all—not after I knew I would be questioned on that (indicating blue-prints) and I got that stuff out to make sure.

Q. Do you know a man by the name of Rudolph Herman, secretary or officer of some kind in the Layne & Bowler Company?     A. Harmon, yes.

Q. Did he talk to you about this case?     A. Yes.

Q. How long ago?

A. About some time—about the same time I received the telegram from Townsend.

Q. Where did he talk to you, in Milwaukee here?

(Deposition of William Clasmann.)

A. Here in this office.

Q. How long have you known him?

A. That is to the best of my knowledge, the first time I met the man.

Q. How long did you talk to him in reference to it?

A. I guess he was in there—in here about half an hour or so.

Q. That was after this telegram that you referred to on your direct examination? [276]

A. No, not after, that was before I got that telegram.

Q. Did you ever recommend Byron Jackson pump to the Schlitz Company, here in Milwaukee?

A. I don't remember whether I recommended it to the Schlitz Company, but I have, wherever I had a chance, spoken a good word for Byron Jackson.

Q. It is a fact that Schlitz did purchase and use several of those Byron Jackson pumps?

A. Yes.

Q. And the Pabst Company after the first one, they purchased others right along, did they?

A. They purchased—let us see—if it is material I can count the number—

Q. Yes, you might give us the number.

A. I think we purchased five in all.

Q. The first pump was installed in 1902, wasn't it?

A. 1903 to the best of my knowledge—it was bought in 1902, I think,—I don't remember now.

Q. As a matter of fact, it was ordered in 1901 and installed in 1902, wasn't it?

A. I don't believe it was ordered in 1901—it was installed late in 1903.



(Deposition of William Clasmann.)

Q. You did not look up any records on that, did you?

A. I did not look up all the records, because I looked up those drawings—I could not give you any of those dates if it would not be for the dates on the drawings. [277]

Q. Who carried on the correspondence relating to these Byron Jackson pumps on behalf of the Pabst Brewing Company?

Mr. LYON.—Objected to as assuming a fact not testified to by the witness, if there was any correspondence between the Byron Jackson Company and the Pabst Brewing Company, direct.

A. Mr. Gustav Pabst and the Purchasing department.

Q. Who was the head of the purchasing department?

A. I believe Mr. Bates. He is dead now. He was head of the purchasing department at the time, and later on Arthur Muth—he had some of the early correspondence,—but I don't remember whether—

Q. Is Gustav Pabst here now?

A. He is residing in Milwaukee.

Q. Still associated with the brewery,

A. Still associated with the brewery. He is president of the concern, yes.

Q. As I understand it, the guarantee Byron Jackson gave was based on the condition that the pump be properly oiled? A. Yes.

Q. And that you used oil as a lubricant?

A. Well, I don't remember now exactly how that

(Deposition of William Clasmann.)

contract read, but we oiled it with oil and it broke down while it was oiled.

Mr. LOFTUS.—I move to strike out the answer as not responsive. [278]

Mr. LYON.—I resist the motion.

Mr. LOFTUS.—Q. Just answer the question and I will get it straight. Do you know whether or not the contract provided that—

A. I don't remember the wording of the contract on that.

Q. You don't know whether it provided that it must be properly oiled and oil used as a lubricant?

A. I don't remember that.

Q. Do you remember that Pabst wrote to Byron Jackson Company stating in substance that they would discontinue the use of oil and use water solely as a lubricant and Byron Jackson protested against the use of water and the discontinuance of the use of oil?

A. I remember that there was some correspondence on that subject, but I cannot remember the nature of it.

Q. Do you remember that Pabst said he would not hold him to the guarantee—that he would use water and release him of the guarantee?

A. I don't remember that exactly—it might be for all I know. The records will show.

Q. Pabst, as far as your company is concerned, he was the last word on what was done?

A. By "your company" you mean Pabst Brewing Company?

Q. Yes.      A. Yes.

(Deposition of William Clasmann.)

Q. He gave the final instructions? [279]

A. Yes.

Q. In fact, he had the entire charge of the purchase and installation of this particular pump?

A. Yes.

Q. You did not yourself oil this pump, did you?

A. No, it was not part of my work to oil the pump. I did not oil the pump—I may have put some oil on it one time or another—

Q. Just answer the question, the question is clear.

A. It was not oiled by me—it was not part of my work. It was oiled by the men in my charge.

Mr. LOFTUS.—Strike the answer as not responsive.

Q. Just answer “Yes,” or “No,” you did not have anything to do with the oiling of the pump?

A. The oiling of the pump was in my charge.

Q. Did you yourself oil the pump?

A. No, I did not oil that pump personally.

Q. Where was your office located with respect to where the pump was being used?

A. My office was located in what they call the old school building, 9th and Chestnut.

Q. That was a separate building from the pump?

A. Yes, separate building.

Q. How far from that?

A. Three quarters of a block—I think that is as close as you can set it. [280]

Q. Who instructed you to discontinue the use of oil as a lubricant?

A. I don't remember what procedure was taken, whether there was any special instructions, or

(Deposition of William Clasmann.)

whether it was without anybody's instructions that I proceeded.

Q. Why did you discontinue the use of oil?

A. Why?

Q. Yes.

A. Because the oil was objectionable.

Q. In what way?

A. Because oil did not give us all lubrication needed. In the first place the oil was objectionable for having it in the water, second place, the oil did not work down and give us sufficient lubrication—the upper bearings would be in fairly good shape while the lower bearings would eat out and then trouble would begin.

Q. Strike that out—the reason that Pabst himself instructed that you discontinue the use of oil was because it collected or adhered to the inside of the beer keg when washing these kegs, and for that reason it was objectionable.

Mr. LYON.—Objected to as assuming a fact not testified to by the witness.

A. The oil was objectionable because we felt we could not use oily water in our business.

Mr. LOFTUS.—Q. You used the water for washing kegs? A. For any other purpose. [281]

Q. That is what it was intended for primarily, washing kegs?

A. No, it was intended for all kinds of purposes throughout the brewery and principally for the purpose of ammonia condensing—for ammonia condensing purposes.

Q. You say you never did any oiling yourself?

(Deposition of William Clasmann.)

A. I never oiled the pumps personally, no,—perhaps once or twice or perhaps I showed a fellow or instructed some fellow there. The actual performance of oiling was not part of the work that I assumed.

Q. It was not due to worn bearings that the pump finally failed to operate with full effect?

A. What have you reference to, the first fall down of the pump?

Q. Yes.

A. Well, it was due to misconstruction of the inner casing—the whole thing was too weak.

Q. Now, wasn't it due to the worn bearings?

A. It was due to set screws shaking loose and it was due to poor threads and as far as bearings is concerned, there was perhaps some bearing trouble also, but the main trouble was with the rigging, that the inner casing supporting the bearing was not strong enough.

Mr. LOFTUS.—Strike it out. Just hold yourself down to the bearing. You can answer that yes or no.

Mr. LYON.—We submit the witness has fully answered the question, if counsel means due solely to the worn bearings. [282]

Mr. LOFTUS.—Just a moment,—he is under cross-examination now.

Mr. LYON.—Well, we submit that the witness is entitled to answer the question as he understands it.

A. If you ask me for any particular case when the breakdown was, I can answer that question, but there was so many breakdowns and one answer

(Deposition of William Clasmann.)

would do for one breakdown, while the answer would not do for another breakdown at all—well, the answer wouldn't do for the other.

Mr. LOFTUS.—Q. Well, as originally installed, with the inner and outer casing and using oil as lubricant, the pump did actually operate successful for a substantial period, didn't it?

A. For a period of about two months.

Q. And then later on the Busch Company paid for that pump. How much did they pay for that pump? Do you remember?

A. I don't remember; somewhere around \$2,500; I couldn't tell you that exactly.

Q. And after paying for it subsequently purchased two more—at least two more?

A. They purchased two more, but before they paid for it or about the time—

Q. Never mind,—they purchased some after they paid for it?

A. They purchased some after they paid for the first.

Q. How many?

A. Two more. Well, they purchased 5 pumps in all, to the best of my recollection. [283]

Q. Do you know what they paid for those other five?

A. For the pump alone they paid somewhere around eight or nine hundred dollars; I don't remember.

Q. Have you any connection with the Pabst Company now?

A. None whatsoever. O, I am not myself clear

(Deposition of William Clasmann.)

now—you mean any employment? I sell them some stuff once in a while, but you would not call that “connection”?

Q. You are not acting as engineer for them or in a representative capacity? A. No, no.

Q. Just what was supposed to be your work during the years 1902, 1903, and 1904, while with the Pabst Brewing Company?

A. I had charge of all machinery.

Q. What do you mean, “charge”? Going around and seeing that—

A. Well, all the men in all the mechanical departments, machinists, steamfitters, the engineer's office was under my direction and jurisdiction and I had charge, as you see—

Q. The purchase of these pumps, though, that was handled entirely by Mr. Gustav Pabst himself, that is correspondence communications, and he was the final word as to whether he would put it in or would not? A. Yes.

Q. And you took instructions from him?

A. I took instructions from him.

Q. He investigated the proposition himself and satisfied his own mind on the proposition before he ordered?

A. He satisfied his own mind and I was his adviser. [284]

Q. But you were under his instructions?

A. Yes, the same as boss and employee.

Q. As to the actual operation of the pump, Peter—What is his last name? A. Jessrang.

Q. (Continuing.) Jessrang really had more to

(Deposition of William Clasmann.)

do with it than anybody else connected with the Pabst Company? A. No, he did not.

Q. He was the man that suggested the changes, whatever changes were made?

A. He is not the man that suggested changes. The changes were made in our office. There may be some suggestions—

Q. If he says he made changes, his testimony is not true?

A. He may have suggested changes—there may be something to that; I don't remember that.

Q. Do you know anybody by the name of Henry Danischefsky? A. Yes.

Q. What is his position?

A. He is at the present time vice-president of the Pabst Brewing Company, and general manager.

Q. How long has he been general manager?

A. O, about six or seven years.

Q. What was he doing during the years 1902, 1903 and 1904?

A. He was not connected with the Pabst Brewing Company.

Q. He was not? A. No.

Q. For how long a time did they use oil as a lubricant on [285] the first pump?

A. I could not say exactly for how long a time we used oil as a lubricant during the first period until the pump broke down.

Q. First two months?

A. Yes, we did and then we started water lubrication, but I don't know if we did right after that or not.



(Deposition of William Clasmann.)

Q. As a matter of fact, you started water before that?    A. No, we didn't.

Q. Are you sure about that?

A. To the best of my knowledge, yes. I would not be so awful sure about that because it is too long a time—hold on—no, sir,—wait a minute—we did not use water before it broke down.

Q. As a matter of fact, didn't they only use oil for about two days after the pump was put in, discontinuing using oil and using water after that?

A. No, sir.

Q. Are you sure about that?    A. Yes, sir.

Q. If you are mistaken, you are mistaken as to all the rest of your testimony?

A. I am not mistaken about that.

Q. You are certain you used oil up to the time it broke down?

A. I am certain we used oil up to the time it broke down. It was a question then—

Q. Just a moment—just answer the question. You are positive [286] on that?    A. Yes.

Q. You are positive they oiled—the pump was well oiled every day?

A. The pump was well oiled.

Q. You actually saw it oiled?

A. Yes, it was my business to see that it was properly done.

Q. You are absolutely certain that the pump was oil fed for a period of about two months?

A. Well, Jackson's man was there.

Q. Now, isn't it a fact that they discontinued oil on the pump and that Robb protested and wired

(Deposition of William Clasmann.)

Jackson and Jackson came back with a letter to Pabst protesting against the substitution of water for oil?

A. I don't remember exactly the correspondence any more, but the oil was used until the pump broke down.

Q. How do you happen to fix that in your mind that it was used up to that time?

A. Well, I know very well that we were going to run the test out.

Q. Didn't you have in your mind certain improvements that you wanted them to put on?

A. I did not have any improvements in my head at all until that breakdown, until there was no end of trouble.

Q. Well, it ran all right for two months, didn't it, and pumped the water? A. Yes. [287]

Q. It was operated every day during that time, during those two months?

A. Practically every day without any interference to amount to anything.

Q. Sundays, I suppose. And during that time operated just as installed?

A. Yes, sir, operated just as installed.

Q. Do you know Mr. Mead down at Madison?

A. At Madison, yes.

Q. How is he considered in the engineering fraternity, his standing or rating?

Mr. LYON.—Objected to as not proper cross-examination.

A. Mr. Mead's standing is a good one, as much as I know.

(Deposition of William Clasmann.)

Mr. LOFTUS.—Q. One of the leading sanitary engineers—one of the leading engineers of the country, isn't he?

A. I would not say one of the leading engineers,—is an engineer of some reputation.

Q. He was consulted by Pabst at the time of purchasing the Byron Jackson pump or before purchasing it?

A. Do you want a yes or no on that? Yes.

Mr. LOFTUS.—I think that is all. [288]

Redirect Examination.

(By Mr. LYON.)

Q. On cross-examination you stated that you recommended the Byron Jackson pump to the Schlitz Company. What are we to understand from that answer?

A. I did not state that I recommended to the Schlitz Company. I said possibly I did, and by recommending the Byron Jackson pump I had reference to the pump proper.

Q. Did you or did you not include in that this shaft enclosing casing and the bearings and the oil lubrication system?

Mr. LOFTUS.—Of course that is objected to as leading.

A. Whenever talking about the Jackson pump I made it a point to emphasize the fact—the trouble we had with that inner casing and I have never recommended the drive of the pump in the manner that Jackson has furnished it to anybody, but the pump proper I have recommended repeatedly.

Mr. LYON.—That is all.

Mr. LOFTUS.—That is all.

(Deposition closed.)

(Signed) W. CLASMANN. [289]

In the Southern Division of the United States District Court for the Northern District of California, Second Division.

EQUITY—No. 485.

INFRINGEMENT OF LETTERS PAT. 821,653.

LAYNE & BOWLER CORPORATION, a Corporation,

Plaintiff,

vs.

WESTERN WELL WORKS, INC., a Corporation et al.,

Defendants.

State of Wisconsin,  
Milwaukee County,—ss.

I, W. Schultz, a notary public within and for said county and state, duly commissioned and sworn according to law, do hereby certify that the foregoing deposition of William Clasmann was taken before me in the above-entitled suit, commencing at the hour of 10 o'clock A. M. on Saturday, February 21st, 1920, at the place named in the foregoing record; that said William Clasmann before giving his testimony was by me duly sworn to testify the truth, the whole truth and nothing but the truth according to law; that the parties to

said suit were represented by counsel as in the foregoing record set forth; that the foregoing is a true and correct record of all the proceedings had and taken during the taking of said deposition, together with a correct statement of the questions and answers propounded to and given by the witness; that the foregoing record is a true and correct statement of all proceedings and testimony had and given [290] upon the taking of said deposition; that the exhibits referred to therein were offered in evidence and have been identified and marked by me and are returned herewith; that I am not connected by blood or marriage with either of the parties to said suit, nor interested directly or indirectly in the subject-matter or the events thereof; that said deposition was read over and signed by said William Clasmann in my presence, counsel for the respective parties having waived being present at the signing.

[Seal]

(Signed) W. SCHULTZ,

Notary Public in and for Milwaukee County, Wisconsin.

My commission expires Aug. 2, 1920.

Dated, Milwaukee, Wis., Feby. 25/1920. [291]

No. 6484.

State of Wisconsin,

County of Milwaukee,

Office of the Clerk of the Circuit Court,—ss.

I, the undersigned, Clerk of the Circuit Court of the County of Milwaukee, in the State of Wisconsin (said court being a court of record and having common-law jurisdiction, a clerk and a seal), do

hereby certify that W. Schultz, Esquire, whose name appears subscribed to the annexed instrument, was at the date thereof a notary public within and for said state, residing in said county, duly appointed and qualified, and empowered by the laws of said state to administer oaths, take depositions and acknowledgments of deeds, and perform such other duties as by the law of nations, or according to commercial usage, may be performed by notaries public, and that to his acts and attestations as such, full faith and credits is and ought to be given in court and out. I further certify that I am well acquainted with the signature and handwriting of the aforesaid notary public, and I verily believe said signature, purporting to be his, is genuine, and that the seal hereto attached is a correct impression of his official seal.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the seal of said court at Milwaukee, in said county, this 25th day of February, 1920.

[Seal]

MAX E. BINNER,  
Clerk of Circuit Court. [292]

In the Southern Division of the United States District Court for the Northern District of California, Second Division.

EQUITY—No. 485.

INFRINGEMENT OF LETTERS PATENT  
821,653.

LAYNE & BOWLER CORPORATION, a Corporation,

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WESTERN WELL WORKS, INC., a Corporation,  
et al.,

Defendants.

**Notice of Taking Depositions.**

To Defendants Above Named, and to Chas. E. Townsend, Chas. M. Fryer and Wm. A. Loftus Esqs., Attorneys for Defendants:

Please take notice that at ten o'clock in the forenoon, on Saturday, February 21st, 1920, at the office of W. Clasmann, 620-621 Wells Bldg., Milwaukee, Wisconsin, before a notary public or other competent officer, we shall proceed to take the depositions *de bene esse*, of W. Clasmann, Peter Jessrang and Joe Maleseck, each of Milwaukee, Wisconsin, and each of whom resides in said city of Milwaukee, Wisconsin, more than one hundred miles from San Francisco, California, where the court in which the above-entitled cause will be tried is appointed by law to be held; the depositions so taken to be read in evidence at the final hearing and trial of said cause on behalf of the plaintiff.

The taking of these proofs will be under Section 863 of the Revised Statutes of the U. S., and the Rules and Practice for Courts of Equity of the U. S., and will be continued from day to day until completed. You are invited to be present and cross-examine the witnesses if you so desire.

Dated Chicago, Illinois, February 13th, 1920.

FREDERICK S. LYON,  
LEONARD S. LYON,  
WM. K. WHITE and  
TAYLOR E. BROWN,  
Solicitors for Plaintiff. [293]

Service of the foregoing notice is accepted, and receipt of copy thereof acknowledged, at Chicago, Illinois, this 13th day of February, 1920.

WM. A. LOFTUS,  
Attorney for Defendants.

[Endorsed]: Filed Mar. 1, 1920. W. B. Maling,  
Clerk. By J. A. Schaertzer, Deputy Clerk. [294]

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In the United States District Court, Northern District of California, Southern Division.

IN EQUITY—No. 485.

FOR INFRINGEMENT OF LETTERS

PATENT No. 821,653.

LAYNE & BOWLER CORPORATION,  
Plaintiff,

vs.

WESTERN WELL WORKS, INC., a Corporation,  
et al.,

Defendants.



**Depositions.**

Deposition *de bene esse* taken on behalf of defendants in the above-entitled suit, before Hattie B. Lehman, a notary public in and for the County of Cook and State of Illinois, at Room 1503 Marquette Building, Chicago, Illinois, commencing at the hour of 5 P. M., on February 11, 1920, pursuant to agreement of counsel.

Present: FREDERICK S. LYON, Esq., on Behalf  
of Plaintiff;

WILLIAM A. LOFTUS, Esq., on Behalf  
of Defendants.

Whereupon the following proceedings were had:  
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By Mr. LOFTUS.—In view of the fact that the testimony about to be taken at this time on behalf of these defendants is to be the same testimony to be used by the defendants in the case of this same plaintiff against the American Well & Prospecting Company et al., being suit in equity No. E-42, pending in the United States District Court for the Southern District of California, and inasmuch as counsel for the said American Well & Prospecting Company et al. is present and has already given notice of his intention to examine this same witness upon the same matters touching the present case, and in order to prevent duplication of the examination of this witness in the two causes, and for the purpose of saving time and expense of all parties concerned, I will state, on behalf of the Western Well Works, Inc., and the other defendants in this case, that I shall waive the examination

of this witness in favor of Mr. Blakeslee, attorney for the defendants in the American Well & Prospecting Company et al. case, and will accept and adopt his examination and the testimony adduced thereby as the testimony and record in this case, reserving, of course, the right to interpolate interrogatories or objections as may appear necessary or proper. [296]

In the United States District Court, Southern District of California, Southern Division.

IN EQUITY—No. E-42.

Before Hon. LYNN HEIM, as Special Master.

LAYNE & BOWLER CORPORATION,  
Plaintiff,

vs.

AMERICAN WELL & PROSPECTING CO.  
et al.,

Defendants.

Met pursuant to adjournment as noted on the record of depositions as taken at the office of Burr W. Jones, Badger Block, Madison, Wisconsin, Tuesday, February 10, 1920, at the office of Clarence J. Loftus, Room 1434 Marquette Building, Chicago, Illinois, and as per stipulation between counsel, at the hour of 2 o'clock P. M., Wednesday, February 11, 1920, for the purpose of taking the deposition of J. W. Alvord under the stipulation and order of the Court.

Present: FREDERICK S. LYON, Esq., Solicitor  
and Counsel for Plaintiff;

RAYMOND IVES BLAKESLEE, Esq.,  
Solicitor and Counsel for Defendants.

At this hour an adjournment was taken by consent to the office of Hattie B. Lehman, notary public, 1503 Marquette Building, Chicago, Illinois, at the hour of 4:30 o'clock P. M., at which hour counsel for plaintiff and defendants appeared as last recited.

Thereupon proceedings were had as follows:  
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By Mr. BLAKESLEE.—Notice is hereby given that defendants will, on further specific notice, move the Honorable Special Master, to whom this cause has been referred to try and determine same, for an order permitting defendants to amend the amended answer of defendants herein by the insertion of the following matter:

Paragraph XXI. As a separate and alternative defense, defendants allege and aver that the alleged invention of the pretended Layne letters patent sued under in the bill of complaint herein, and particularly the alleged invention of claims 9, 13 and 20 thereof, and alleged to be set forth, claimed or patented in and by said pretended letters patent 821,653 and claims 9, 13 and 20 thereof, are wholly void and of no legal effect whatsoever, in that said Mahlon E. Layne surreptitiously or unjustly obtained said pretended letters patent, and particularly as to the alleged improvements mentioned and claimed in said claims 9, 13 and

20 thereof, for that which was, in fact, invented by another, to wit, John W. Alvord, of Chicago, Illinois, who was using reasonable diligence in adapting and perfecting the same, and who filed applications for letters patent of the United States and received letters patent of the United States for same, or parts or all of same, as follows, to wit:

Application for U. S. letters patent No. 735,-690, filed November 17, 1902, letters patent issued August 11, 1903; [298]

Application for U. S. letters patent No. 735,-691, filed December 24, 1902, letters patent issued August 11, 1903;

Application for U. S. letters patent No. 735,-692, filed March 30, 1903, letters patent issued August 11, 1903,

and who never abandoned same.

Wherefore defendants, and each of them, pray for dismissal of the bill of complaint, for their costs and disbursements, and for such other and further relief as may be meet and proper.

By Mr. LYON.—Plaintiff declines to accept any such notice of intention to move for leave to amend the defendants' answer in this case. If the purpose of the Alvord deposition be to attempt to prove the stated allegations of any such proposed amendment to the answer, defendants object on the ground that the taking of such deposition at this time is not within the intent or purport of the stipulation or order of the Special Master; that such deposition or such testimony will not be germane to the issues

of the case, and plaintiff, upon return to Los Angeles, will move the Special Master to award to plaintiff, and against defendants, judgment for the expenses to which plaintiff is put by reason of attendance upon the taking of the deposition of J. W. Alvord at Chicago, Illinois, the same so being entirely immaterial, incompetent and inadmissible under the pleadings and not within the matter which was the object of the continuance and permission to take depositions. [299]

By Mr. BLAKESLEE.—We stand upon the stipulation and order of the Special Master under which we are about to take the deposition of the said John W. Alvord and notice of motion last given on the record, and the testimony of the witness will speak for itself in these respects and in any others in which we adduce evidence from such witness.

By Mr. LYON.—The plaintiff's objection will not be repeated to this deposition on this record and will be understood as taken and reserved to any deposition taken by defendants, of said John W. Alvord, if the subject matter of such deposition, or the interrogatories propounded to him, be directed toward the stated allegations of amendment to the answer to-day specified by defendants' counsel. This objection will be understood as reserved, and upon the reconvening before the Special Master motion to strike the same from the case will be made and the Master requested to rule thereon before proceeding further in the case.

I anticipate that you desire, Mr. Blakeslee, that we await the appearance of Mr. Alvord, do you?

By Mr. BLAKESLEE.—We were to convene at 4:30 by stipulation. It is now 10 minutes of 5:00 and we expect the witness, Alvord, momentarily.  
[300]

**Deposition of J. W. Alvord, for Defendants.**

J. W. ALVORD, a witness produced on behalf of the defendants, being first duly sworn testified as follows:

(Examination by Mr. BLAKESLEE.)

Q. 1. Please state your name, age, residence and occupation.

A. John W. Alvord; residence, Chicago; occupation, civil engineer; age, fifty-nine.

Q. 2. How long have you been engaged in that calling or profession, Mr. Alvord?

A. Forty years.

Q. 3. Most of the time at Chicago?

A. Yes, sir.

Q. 4. Giving special attention to any particular line?

By Mr. R. L. OTWELL, Appearing for the Witness.—I object to that question. He is not an expert witness and he is not qualifying as an expert witness. If he is a witness at all he is simply a witness as to facts.

By Mr. BLAKESLEE.—We object to the appearance for the witness and ask that the examination be not interrupted, unless the witness, through his attorney, raise some question of privilege or constitutional right, but want to object to any action on the record by attorney for the witness in any other respects. [301]

(Deposition of J. W. Alvord.)

Q. 5. Are you the same J. W. Alvord to whom letters patent of the United States Nos. 735,690, 735,691 and 735,692 were issued?

A. I have taken out patents; I have no recollection now of the numbers.

Q. 6. Kindly inspect copies of the patents which I offer you now and state if you can answer the preceding question more fully.

A. The patents shown me appear to be patents for which I have taken out numbers corresponding with your question.

Q. 7. Please state when these matters of these patents first came into existence through your efforts.

By Mr. LYON.—That is objected to, first, as calling for a conclusion of the witness, and assuming facts not testified to by the witness, to wit, that the matters each came into existence, and further, in case No. E-42, upon the ground that is is irrelevant and immaterial and incompetent, not pleaded.

A. I presume they came into existence on the dates shown in the patents themselves.

Q. 8. When did you first have any experience, prior to that, with these matters, as to mental conception or operation?

By Mr. LYON.—Same objection as last noted, and this objection will be understood as repeated and reserved to all questions asked this witness, without the necessity of hereinafter specifically repeating the objection to each question. [302]

A. In answer to the question the witness desires to state that he has been subpoenaed in this mat-

(Deposition of J. W. Alvord.)

ter within one hour of his appearance before the notary, and in matters in which he has had no recent knowledge for many years past, no recollection of any of *the* nor has he been able to refresh his memory within the short notice which he has received.

Q. 9. Are you able or unable to give an answer to the last question?

A. I will be unable to give an answer to it without carefully refreshing my memory by a search on matters which are now long past.

Q. 10. You have no data with you, or memoranda or entries of any sort, which would tend to refresh your recollection in these respects. A. No, sir.

Q. 11. You testified as a witness for the defendants in the equity suit of Mahlon E. Layne et al., Plaintiffs, vs. Fred I. Getty, Defendant, a cause which was at that time pending in the District Court of the United States for the Western District of Louisiana, did you not?

By Mr. LYON.—Objected to as irrelevant and immaterial to the issues of the present case and wholly incompetent. Whatever testimony this witness may have given in any other case is not admissible in this case, as the parties to the litigation are not the same and the testimony that he may have given, or may not have given, in any other case can have no bearing upon any testimony given here.

[303]

By Mr. BLAKESLEE.—We will ask counsel to refrain from bringing argument upon the record, in violation of our permanent equity rule, and we call attention of counsel to the fact that the ques-



(Deposition of J. W. Alvord.)

tion calls for a yes or no answer; and we will ask the witness, on rereading of the question, to answer it in that way.

A. Witness declines to answer it either by yes or no, because he is unable to say either yes or no to the question; he has no recollection of the specific title, time, place or parties to the suit, as stated in the question.

Q. 12. Do you remember testifying on behalf of defendants in a suit in equity involving the letters patent of one Mahlon E. Layne for pumps?

By Mr. LYON.—Same objection as last noted on the record.

A. I remember testifying in some case pertinent to the patents in question. That is about all the recollection I have at this time.

Q. 13. There was only one such occasion, was there not, within your recollection?

By Mr. LYON.—Same objection.

A. I don't recall.

Q. 14. Do you recall more than one such occasion when you so testified in a case of that character?

By Mr. LYON.—Same objection.

A. I don't recall testifying but the one time.

Q. 15. In giving such testimony, and referring to the three letters patent copies of which you have identified as [304] being copies of letters patent of the United States issued to you, did you not state, in answer to a question: "I first devised the means for lining pump shafts in the early part of 1902. My attention was first attracted to the possibility of placing centrifugal pumps in deeper artesian

(Deposition of J. W. Alvord.)

wells by a paper presented to the American Water Works Association. This penciled sketch is dated April 23, 1902, and signed by me in my own handwriting, both date and signature; for the purpose of identification a photograph of this pencil sketch is filed herewith, marked Defendant's Exhibit No. 22. On or about the 23d of April, 1902, my letter file shows that I wrote to George P. Whittlesey, a patent attorney of Washington, D. C., asking him to make a search in the Patent Office at Washington which would disclose the prior art in which I was seeking an invention." In answering this question, I hand you a copy of the testimony to which I have alluded in my question.

By Mr. LYON.—Objected to as leading and suggestive and as incompetent, not the proper method of proof, and as incompetent, irrelevant and inadmissible in this case, it being immaterial in this case what the witness did or did not testify to in some other case unless it be shown that the parties to such litigation were the same as the parties here or are in some manner bound by the decree in such suit, if any, by participation or succession in interest; further, on the ground that the witness is entitled to have placed before him either the original record of such testimony [305] or a duly certified copy thereof; further, that the question can only be asked for the purpose of impeaching the testimony of the witness given in this case, and he having given no contrary testimony the question obviously cannot be impeachment, but is merely an attempt to read into the record in this case alleged testimony alleged to

(Deposition of J. W. Alvord.)

have been given by this witness in some other case between different parties than the parties to this case, and not a competent proceeding in any manner; and plaintiff protests against the procedure and gives notice that he will ask the Special Master to impose the entire cost of the taking of this deposition, and the expenses of plaintiff's counsel in attending thereon, for this violation of the rules.

By Mr. LOFTUS.—I desire to call the Court's attention to the fact that the record shows that this witness is hostile, therefore a leading question is proper. He further states that he does not recall the subject matter of his testimony, therefore the form of the question is proper, in order that his memory may be refreshed.

By Mr. BLAKESLEE.—We repeat the same observations just made by counsel for defendants, Western Well Works and others, and ask that the witness answer the question. [306]

A. The witness denies the allegation of counsel that he is hostile to any fair representation of facts in this case, but protests again that he has been summoned here without reasonable notice, without opportunity to refresh himself as to the facts in the case, and in answering the specific question is unable to recollect that he did or did not make such answer as has been read to him by counsel, or that such testimony as presented to him by counsel is, in fact, his testimony in the prior case.

Q. 16. You appear here in response to subpoena of the United States District Court, do you not?

A. Yes, sir.

(Deposition of J. W. Alvord.)

Q. 17. And prior to the hour of noon to-day you were requested by both counsel for the two defendants here to appear at your convenience to-day and testify voluntarily in these matters, were you not?

A. I was so requested, and I declined because I was engaged on other important matters in which my time was under contract to the city of Madison, and that I could not divert my attention on such short notice to the matters in question.

Q. 18. On the 5th of January, this year, you had a conference with a Mr. Fryer, of San Francisco, an attorney, regarding this same matter and the question of your testifying about these matters, did you not?

By Mr. LYON.—Object to as leading, suggestive, incompetent, it not being shown that Mr. Fryer was or is in any manner connected with or represented the plaintiff in this suit, the fact being, [307] on the contrary, that he represents the defendants in equity case No. 485, and it not being shown that and such conversation was in the presence of the plaintiff or any of its officers, or anyone representing it or in any manner authorized to represent it or connected with it; and as irrelevant and immaterial, not the proper method of proof, and obviously solely for the purpose of incumbering the record, and could be for no purpose competent in this case except for impeachment, and the witness having given no testimony as to any such conversation, or as to any facts germane to this case, cannot be impeached in this case.

A. I am not able to identify the name or the at-

(Deposition of J. W. Alvord.)

torney in question, but an attorney did call at my office and had some conversation with me about testifying in these matters.

Q. 19. And at that time, please state whether or not you discussed your knowledge about these matters which I have inquired into in the preceding questions, namely, discussed them with the said attorney, Fryer.

By Mr. LYON.—Same objections are noted as noted to the preceding question, and plaintiff protests against the continuance of this line of interrogation of the witness. It is clearly an abuse of the process of the court and clearly an abuse of the right to take depositions in this case. It cannot be and it is not certain that the plaintiff in this case had anything to do with any such interview, and it cannot be competent evidence in this case, in any of the issues in this case. [308]

By Mr. BLAKESLEE.—We call the Master's attention to the violation by plaintiff of the equity rule which forbids controversy and argument on the record, and will ask the attorney to refrain from such discussion when the question is re-read, which we likewise request.

Q. 19 repeated.

A. It is my recollection that I discussed them to the extent of stating to the attorney that it was my belief that all of the parties in this suit had infringed my patents and were continuing to infringe them.

Q. 20. Please state anything further that you said in talking with Mr. Fryer at that time.

(Deposition of J. W. Alvord.)

By Mr. LYON.—Same objections as last noted.

A. I don't recall anything further which I stated at that time.

Q. 21. Please state whether or not you discussed with Mr. Fryer at that time your knowledge of inclosed line shafts for pumps, and reviewed your former testimony in these respects with Mr. Fryer.

By Mr. LYON.—Same objection.

A. My recollection is that Mr. Fryer showed me documents which purported to be my former testimony in the case, and that he explained to me the question at issue in a general way.

Q. 22. Did you or did you not recognize the purported copy of your prior testimony as, in fact, being such testimony on that occasion?

By Mr. LYON.—Same objection.

A. No, sir; I did not. [309]

Q. 23. Did you recognize anything appearing in such purported copy of your previous testimony as being in conflict with such previous testimony?

By Mr. LYON.—Same objection.

A. It had apparently the earmarks of being testimony which I may have delivered, but I had no opportunity of verifying it.

Q. 24. Will you kindly look again at the copy of testimony which I have offered you, and at the portion thereof which I incorporated in a previous question in quotation, and state whether that does not agree with what you discussed with Mr. Fryer as being your prior testimony on the occasion mentioned.

By Mr. LYON.—Same objection as last noted on

(Deposition of J. W. Alvord.)

the record, and upon all of the grounds stated in the objections to the question asked this witness in which said alleged quotation from said alleged copy of testimony was given.

A. The testimony which you hand me has the appearance of being testimony which I may have delivered in a former case, but I have no means of verifying that fact.

Q. 25. Well, if it so appears, are you not prepared now to state, one way or another, whether you did not devise your patented means for lining shafts in the early part of 1902, namely, the means which you have previously identified as being reflected in your United States letters patent 735,690? By Mr. LYON.—Same objections as last noted on the record. [310]

A. (Witness declines to discuss alleged testimony which he has had no opportunity of verifying, particularly in view of the way in which he has been suddenly summoned and brought into this case, and in view of the fact that the defendants in this case are, in his opinion, infringers upon his patent.)

Q. 26. Well, if, in your opinion, the defendants in these cases are infringers upon your patent and you wish us to understand that as your testimony, will you please explain why you consider them infringers, and in that connection tell us about the structure of the invention of your patent which you consider so infringed?

By Mr. OTWELL.—Objected to on the ground that he is not on trial here himself as his cases, and it is his privilege, owing to the fact that he

(Deposition of J. W. Alvord.)

has certain rights that he proposes to litigate, and that are not under litigation here, and I would instruct him, not to answer that question.

By Mr. LYON.—We object to the question on behalf of the plaintiff on each of the grounds stated in the last objection on record.

A. On advice of counsel, I decline to answer the question as above stated.

Q. 27. In spite of the fact that you could not be on trial, as your counsel rather mysteriously states on the record, with respect to any question of infringement which might be tried pertinent to your patent or patents, we will again request you to state the elements of your invention, as you remember them, namely, the invention disclosed in these three letters patent which you admit you obtained.  
[311]

By Mr. LYON.—Same objection.

By Mr. OTWELL.—I object, also, on the ground that the letters patent are the best answer to that question as to what his claims are.

By Mr. LYON.—We urge the further objection on behalf of plaintiff that it is incompetent, not the best evidence, the patents speaking for themselves.

A. Witness would state that he is unable at this time to clearly go into the matter, owing to the fact that within an hour of this he had received no notice of the necessity of reviewing the patents themselves, the patents not having been read by him for many years past; that he has been absorbed in other matters of vital importance all of to-day,



(Deposition of J. W. Alvord.)

and could not intelligently answer such a question even if his counsel advised him to do so.

Q. 28. Referring to your patent No. 735,690, for means for lining pump shafts and well casings, will you please tell me what the part adjacent to the number 7 represents in each of the figures of the five views of the drawings?

By Mr. LYONS.—Objected to as incompetent, not the best evidence, the patents speaking for themselves, and upon each of the grounds of objections urged to the preceding questions, and on the further ground that the witness cannot be examined in this proceeding as an expert witness in case E-42, as only fact depositions were to be taken, and under the equity rules in case No. 485, no right to take [312] depositions of experts *de bene esse* exists, there is no order of the Court permitting the taking of such a deposition *de bene esse*.

By Mr. BLAKESLEE.—We cannot recognize any thread of expert testimony running through a question and answer which merely contemplates the inventor or patentee of a patent pointing out the identity of a part shown in his patent drawing, and we are attempting purely to obtain from this witness statements of fact concerning his invention, or alleged invention, and its representation in the drawings.

A. The figure 7 represents a casing, in the drawing inclosing the shaft.

Q. 29. When did there first come before your mind the matter of such a casing inclosing a shaft?

(Deposition of J. W. Alvord.)

By Mr. LYON.—Objected to as leading and suggestive.

By Mr. OTWELL.—I object to the question on the further ground that it might be prejudicial to him in any litigation which he may hereafter have on this same subject matter.

A. The witness is unable to say, having had no opportunity to refresh himself on the matter, which took place many years ago.

Q. 30. Please state whether or not you did not state to Mr. Fryer, the attorney, upon the occasion of the conference I have previously referred to, namely, some few weeks ago, that you were willing to testify again about these matters provided it did not take too much time. [313]

By Mr. LYON.—Same objection as noted to each of the questions heretofore asked this witness in regard to the alleged conversation with Mr. Fryer.

A. I have no recollection of having done so—in fact, my impression is that I stated to him that I was unwilling to take the time now to go into these matters, as I was particularly busy at this time on engineering reports of great importance.

Q. 31. Please state whether or not you did state to Mr. Fryer at that time that you were willing to give such testimony again if it did not inconvenience you.

Mr. LYON.—Same objection as last noted.

A. I have no such recollection.

Q. 32. You will not say that you did not so state?

By Mr. LYON.—Same objection.

A. I will not say that I did not or that I did; I

(Deposition of J. W. Alvord.)

have no recollection about it.

Q. 33. You have no independent recollection at this time as to the year in which you first had presented before you, or when there first came to your attention or comprehension, this inclosing casing 7 of the patent I last referred to in my question?

By Mr. LYON.—Same objection as noted on the record.

A. No, sir; I have no recollection at this time.

Q. 34. Have you any recollection, or have you not any recollection at this time, of writing to Mr. George P. Whittlesey, patent attorney of Washington, D. C., asking him to make a search in the Patent Office concerning a certain prior art? [314]

By Mr. LYON.—Same objections as last noted on the record.

A. I have no recollection at this time as to that matter.

Q. 35. No recollection as to writing that letter to Mr. Whittlesey?

By Mr. LYON.—Same objection.

A. No, sir.

Q. 36. Have you the letter-file still which records the writing or shows the writing of such letter to Mr. Whittlesey?

By Mr. LYON.—Same objection.

A. I am unable to say.

Q. 37. Do you or do you not know whether or not it is now at your office a few blocks from here?

By Mr. LYON.—Same objection.

A. I do not know.

(Deposition of J. W. Alvord.)

Q. 38. When did you last consult or refer to such file?

By Mr. LYON.—Same objection.

A. I don't recall referring to that matter for many years.

Q. 39. Did you or did you not refer to that file when Mr. Fryer was talking with you a few weeks ago?

By Mr. LYON.—Same objection as noted in regard to all questions asked concerning Mr. Fryer.

A. No, sir; I did not refer to that file; I am sure of that.

Q. 40. Did you or did you not, on the occasion of that Fryer conference, look through your testimony given in such previous suit as you say you once testified in about these matters? [315]

By Mr. LYON.—Same objections as noted on the record, and as irrelevant and immaterial.

A. My recollection is that the attorney in question—I don't identify him as Mr. Fryer—showed me what purported to be my testimony in a former suit. I did not read it, I merely glanced at it.

Q. 41. Mr. Alford, we do not wish you, or wish your counsel, to obtain the impression that we are seeking to embarrass you in any manner regarding this present deposition, or to obtain the impression that we are seeking to inquire into any matter which was not developed in the course of the previous deposition you have admitted giving; nor do we seek to embarrass you in the matter of time or brevity of notice with respect to your giving this present deposition. Such seeming pressure on

(Deposition of J. W. Alvord.)

our part is solely due to time limits which have been imposed upon us in this matter by the judicial officer who has ordered the taking of depositions in this case in the east, by the necessities of our shortly returning to California. I wish to inquire, therefore, whether, if arrangements could be made to that end, you could more conveniently, comfortably and fully and satisfactorily answer such questions as I have previously put to you, and others concerning the matters of your previous deposition, at an early date hereafter?

By Mr. LYON.—Object to as not evidence in this case, and as irrelevant and immaterial to all the issues and needlessly incumbering the record, not proper in examination of a witness by deposition in any manner whatsoever; if counsel wishes to make an arrangement with this witness [316] to testify some other time, he is at perfect liberty to do so, but he should not do so under the guise of taking a deposition, and he is not entitled to an answer under oath in a case in which this plaintiff is a party at all.

By Mr. BLAKESLEE.—We merely put this question on the record in order that the objections and reluctances of the witness may be recognized as of record, and particularly in view of the appearance here of counsel for the witness; and the answer we believe is germane to the course which we will further pursue in this matter.

Q. 41 repeated.

A. Witness would state in answer to the lengthy statement of counsel that he has no motives other

(Deposition of J. W. Alvord.)

than those of embarrassment at the sudden and unexpected way in which he has been called to the witness-stand; that he has had no recent opportunity to refresh his mind upon any of the questions asked him; that he recognizes the necessity of being unusually careful and accurate in a matter in which he is vitally interested, and protests again at the manner in which he has been subpoenaed on one hour's notice, without opportunity to refresh himself upon the matters at issue, and that to intelligently answer questions of counsel and throw any light upon the matter would necessitate several weeks of preparation, search in the files and correspondence of his office, and study of matters which have long since passed out of his memory. Such preparation he has no opportunity to make just at this time, as he is engaged in a [317] considerable number of most important engineering, professional engagements for large cities that are awaiting results of his investigations.

Q. 42. Are the records in which you might reasonably expect to find these matters or papers or information readily available to you if you looked for them—these records and files?

By Mr. OTWELL.—Objected to; the witness has answered this question once before by stating that he was not familiar—did not remember what records he had now or had preserved in reference to these matters.

By Mr. LYON.—Objected to as incompetent, irrelevant and immaterial for any purpose in this case, and as assuming facts not appearing in the

(Deposition of J. W. Alvord.)

testimony of the witness, that he now has any records that pertain to any issue of this case.

A. I would not be able to say even that they were or were not without time to investigate.

Q. 43. In what places do you keep such records on file?

By Mr. LYON.—Same objection as last noted on the record.

A. Some of them are at my office, some of them at my house, some of them may exist and some of them may not exist.

Q. 44. Are both of those places—that is, the places that exist—in Chicago?

By Mr. LYON.—Same objection.

A. Yes. [318]

Q. 45. I will ask you again, or a little further, whether now you can tell us anything about these preliminary steps you took about this means for lining pump shafts in well casings prior to the time you applied for patent on same.

By Mr. LYON.—Same objection as noted on the record, and as leading and suggestive.

A. I would not be willing to go into any statement of that kind without adequate preparation and careful research which would make my statement accurate and truthful.

Q. 46. Will it be possible for anyone to assist you in unearthing these records and files to find what you need to refresh your recollection in these respects?

By Mr. LYON.—Same objection as noted on the record, and plaintiff protests against this manner of

(Deposition of J. W. Alvord.)

examination; it can only lead to some other deposition of the witness and counsel should take that matter up with the witness and not take it up under the guise of a deposition and require the attendance of plaintiff's counsel at expense while the defendant's counsel seeks to ascertain whether some kind of evidence exists.

By Mr. BLAKESLEE.—Counsel should remember the present witness appears here, not voluntarily but under subpoena, and we know of no other method of eliciting this information other than by interrogatory.

By Mr. LYON.—The witness has not stated, nor has he indicated, an unwillingness to answer any question [319] that defendants may desire of him, or to give any information as to any evidence which he may have. So far as I understand his statements on the record, they have simply been a protest against being hauled up here by a subpoena on an hour's notice, and certainly it is an abuse of the process of the Court and a disregard of the rights of the plaintiff to prosecute the inquiry as to the willingness of the witness to produce testimony when he has already indicated that, given the necessary time, etc., he would not be unwilling to do what he could for the defendants.

By Mr. BLAKESLEE.—We fail to recognize any ground, within the rules of evidence asserted by counsel in his long statement, which amounts to proper objection, and we again protest against the violation by counsel of the equity rule which forbids argument upon the record. We shall move to tax



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the expense and cost of this deposition to plaintiff if this course is continued.

Q. 47. Reread.

A. Not materially.

By Mr. BLAKESLEE.—We will ask the witness to make such search for data, records and files as he may need to refresh his recollection regarding these three patents inquired about and the matters therein shown and described, and to produce same at this place at the hour of 10 o'clock on Friday, the 13th of February, 1920, until which hour the [320] witness is excused as far as defendants in cause E-42 are concerned.

By Mr. LYON.—We call counsel's attention to the fact that the time for taking depositions under the stipulation and order of the Special Master, so far as such time extent on behalf of the defendants is involved, expires to-day; that plaintiff has been exceedingly lenient and courteous in attending at the times for taking depositions, and that without a further order of the Special Master the plaintiff will decline to attend the taking of any such depositions; that the stipulation requires the plaintiff to close its eastern depositions to be taken on this trip on or before next Monday evening, and that such stipulation provides that plaintiff shall have all of the time intervening between the present date and next Monday in which to do so. The fact that the defendants in case E-42 have not prepared to take the deposition of this witness, though having had since the last adjournment before the Master in which so to do, is no excuse for their now violating

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the stipulation and order of the Special Master.

By Mr. BLAKESLEE.—The exigencies of the case will make it apparent that the course we are forced to pursue is necessary, and we shall ask, upon our return to Los Angeles, that the Special Master make an order that the depositions be considered [321] taken within the time permitted by the stipulation and order *nunc pro tunc*, and shall make a showing at that time, upon the first appearance before the Special Master, of the exigencies and circumstances of the present situation. At the same time we shall move the Master for an order to amend the answer of defendants as noticed upon the record at the commencement of these proceedings, and at this time we offer in evidence the three printed copies of United States letters patent Nos. 735,690, 735,691, and 735,692, identified by the witness, as Defendants' Exhibits "A-1," "A-2" and "A-3," respectively, and ask that the same be so marked.

By Mr. LYON.—Objected to as incompetent, irrelevant and immaterial, and this objection is reserved to each part, recital and portion of each of said purported copies of patents.

By Mr. BLAKESLEE.—We, of course, make this offer under our motion to amend the answer in the respects just mentioned. [322]

Thereupon the following interrogatories were propounded to the witness in the case of Layne & Bowler Corporation vs. Western Well Works, Inc., in Equity, No. 485:

(By Mr. LOFTUS.)

Q. 48. Mr. Alvord, as I understand from your

(Deposition of J. W. Alvord.)

testimony, you do not know at the present time where the records are located which would enable you to refresh your memory regarding your early work on the subject matter of your various patents?

By Mr. LYON.—Objected to as irrelevant and immaterial, and leading and suggestive, and as assuming facts not testified to by the witness, that there are any records. A. No, sir.

Q. 49. How long would it take you to find out where those records are?

By Mr. LYON.—Same objections.

A. I could not say.

Q. 50. Will you please look into this matter, make an effort to locate these records, and report the results of your search at 10 o'clock on Friday, February 13th, at the same place—till which time you are excused?

A. I decline to do so on the ground that I am now under contract in important vital matters for large municipal corporations; every minute of my time is engaged and will be for some time to come.

Q. 51. Do I understand the witness to say that he refuses, under this subpoena, to look for the existence of any such records? [323]

A. I do at this particular time.

Q. 52. And to report the results of his search after a lapse of thirty-six hours?

A. Witness wishes to state that having been shown no legal courtesies whatever in this case, no consideration at all for his other and professional engagements or contracts, he is under the necessity of declining to take time, at this time, which be-

(Deposition of J. W. Alvord.)

longs and is contracted for by other corporations, which contracts he is bound in honor to observe, and which will prevent him from doing as counsel requests.

By Mr. BLAKESLEE (to Notary).—Note an adjournment in both cases in all matters until the hour of 10 o'clock A. M., at this place, February 13, 1920.

By Mr. LYON.—Please note in behalf of the plaintiff a protest and an objection, and especially in E-42, on the ground that it is a violation of the stipulation and order of the Special Master and a direct violation of the personal agreement of counsel. Counsel knows that it has been agreed that plaintiff's counsel may leave Chicago on the morning train to-morrow for Washington; that his transportation is bought and arranged, and that he has a hearing in the United States Patent Office on February 13, 1920, which he must attend, and that there is neither an answer which will permit the introduction of the apparently sought testimony of this witness in this case, nor an [324] issue raised by the pleadings under which such testimony is competent, relevant, material or admissible, and until a hearing has been had upon the motion which counsel signifies he will hereafter make the testimony of this witness in case E-42 is not germane to the issue and is inadmissible.

By the WITNESS.—Witness wishes to state that the hour and date of the adjournment arbitrarily fixed by counsel are such as conflict with obligations which he has incurred to be out of the City on im-

(Deposition of J. W. Alvord.)

portant matters on which he is under contract professionally, and that unless he attends will be a serious loss to his clients in a very important matter.

By Mr. BLAKESLEE.—In response to the last observations of counsel for plaintiff, we resent his statement that there is any violation in this planned procedure of any stipulation or agreement in this matter, for these reasons: The stipulation and order under which we are proceeding, namely, the stipulation as approved by the Special Master, permitted us to proceed for defendants until the end of this present day. We assert our right to do so, and we further state that had this deposition of the present witness Alvord, been completed to-day we would have gladly accommodated counsel to take any rebuttal deposition [325] he wishes to take, such as the deposition of the witness Classman, at any time this evening, but we decline to depart from the stipulation and order of the Court and to permit any rebuttal procedure by the plaintiff until we have completed these eastern depositions of the defendants. We submit that if counsel is forced to leave the city to-morrow, as we understood previously to be the fact, that it should be easy for him to obtain the assistance of some associate counsel to interrogate the witness Classman.

Furthermore, as to the pleadings, we wish to assert that if counsel had objection to the taking of the deposition of the witness Alvord that objection should have been urged at the time the stipulation and order were made. The testimony of the present witness relates to matters of the prior art as well

(Deposition of J. W. Alvord.)

as to matters to be pleaded in any amendment to the answer, and as to such amendment we will abide the ruling of the Master.

By Mr. LOFTUS.—The witness is instructed that he is not excused under this subpoena, but is required to report here to complete his testimony on Friday, February 13th, at 10 o'clock.

By the WITNESS.—Witness calls attention to the fact that it is long past the usual time for closing.

Thereupon the further taking of testimony herein was adjourned to Friday, February 13, at 10 A. M.  
[326]

Friday, February 13, 1920, 10 o'clock A. M.

Parties met pursuant to adjournment, at the hour of 10 o'clock A. M.

Present: TAYLOR E. BROWN, Esq., of Chicago,  
Representing Plaintiff's Counsel, Frederick S. Lyon;

WILLIAM A. LOFTUS, Esq., on Behalf  
of Defendants.

Thereupon the examination of the witness, J. W. Alvord, was resumed as follows:

(By Mr. BLAKESLEE.)

Q. 53. Have you been able to find any of your files and records concerning these matters of your pumps and pump patents and the early incidents connected with those matters?

A. Before answering counsel's question, witness again desires to enter a protest against the improper and unfair way in which he has been subpoenaed on short notice in this matter, at a time when he is

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laboring under great pressure of other professional matters and when he has had no opportunity to make any adequate or proper preparation in the matter.

Answering your question, I would say that I have had no opportunity to make any reasonable or proper search of the matters in question. I have looked up my diaries at my home for the years 1902 and '02, these being readily accessible. I also, in one file readily accessible at the office, discovered a paper memoranda made by me apparently [327] in preparation of a former case in this matter in which I testified, which somewhat refreshes my memory as to certain dates. That is all of the opportunity I have had for investigation, being, as I have said, much pressed with other matters and having been obliged to-day to cancel a very important engagement at Rockford, Illinois, in behalf of the city, to be present at this hearing.

Q. 54. Refreshed as your recollection has been in accordance with the statements of your last answer, can you now tell us when it was there was first a presentation to your mind of these matters referred to or concerned in your patent No. 735,690, for means for lining pump shafts in well casings, and I now hand you a copy of that patent, being Defendants' Exhibit "A-1."

By Mr. BROWN.—On behalf of the plaintiff' objections spread upon the record by Mr. Lyon to the deposition of the witness are here repeated, and at the risk of repetition the following objections are spread upon the record: The question apparently

(Deposition of J. W. Alvord.)

seeks to establish the date of conception of the invention of the witness, and if this is for the purpose of proving, or tending to prove, prior invention, the objection is made that the answer does not set up prior invention by the witness Alvord, and that therefore all testimony on the subject at this time is not germane to the issues and is immaterial. Further objection is made that the question is indefinite and irrelevant. [328]

A. I am unable to say when the presentation first arose in my mind, but it must have occurred some time after June, 1901, and before April 8, 1902, during which time I was interested in the subject of these patents and more or less thinking about them.

Q. 55. Is there any attendant circumstances or incident by which you fix, or by which you are assisted in fixing, the dates you have mentioned in your last answer, and, if so, state it.

By Mr. BROWN.—Same objection.

A. I find in my diary which I kept at that time, under date of April 8, 1902, the following entry: "Get a new idea in deep well pumping and take it over to John A. Cole & Sons. Am turned down." And under date of the following day, April 9, 1902, I find the following entry: "Take my idea to Porter and find interested backer. Says he will pay cost of an experiment. Talked to Meade." Under date of April 11, 1902, I find the following entry: "Work on my deep well pump idea."

Q. 56. Is that present or past tense?

A. "Work on my deep well pump idea." In one



(Deposition of J. W. Alvord.)

of my available files at the office I find a paper which has memoranda which I recognize as being a memoranda I made in preparation for appearing in a case in which I testified about the year 1911. I also find attached to such paper a piece of envelope stamped with the postmark "1911," upon which is written: "U. S. Circuit Court, Eastern District of Texas. Mahlon E. Layne, complainant, vs. El Campo Machine Company and W. T. Gray. In Equity, No. 503," which notation presumably was the title of the case in question. [329] On this paper, which shows at the time that I was a consulting engineer at 1212 Hartford Building, I find the following notes:

Q. 57. Let me interrupt you a minute. What date is that you mention?

A. There is no date on this paper. (Reading:) "Simmons paper read at Murray Hill Hotel, New York City, June 17 to 22/01." And again: "Letter to Whittlesey, April 23/02 for search." And again: "First signed pencil sketch of inclosed shaft, April 23/02." And again: "Completed drawing of impellor with inclosed shaft May 1/02." And again "Completed drawing July 1/02; attested before a Notary." And again "Application filed November 17/02, No. 131,663." And again: "Patent dated August 11, 1903, Patent No. 735,790." As far as I know at this time, these memoranda, made in my own handwriting, represent my search made at that time for authentic dates important in this matter, and are correct with one exception, that the note on the letter of the

(Deposition of J. W. Alvord.)

search rather than my request for the search, as evidenced by the reply in the same file in which this paper was discovered.

By Mr. BROWN.—Objection to the question is here repeated to the answer.

Q. 58. And when were these various memoranda made that you have told us about, with reference to the dates that you have mentioned in connection with the several memoranda?

By Mr. BROWN.—Same objection.

A. The entries in the diary were made on the day that is stated—April 8th, 9th and 11th, 1902. The dates on the memoranda I am unable to identify, as the memoranda has [330] no date upon it, the only identification being the fragment of an envelope which has a postmark stamp 1911 visible and remaining upon it.

Q. 59. Where has that diary been since the year 1902?

By Mr. BROWN.—Same objection.

A. It has been in my possession.

Q. 60. Can you tell us, now, what you did in connection with this search of April, 1902, which you say you made through Mr. Whittlesey?

By Mr. BROWN.—Same objection.

A. No, sir, I have no recollection about that other than he was my regularly employed attorney and made that and similar searches for me at that time.

Q. 61. And what, if anything, did you send Mr. Whittlesey in this connection?

By Mr. BROWN.—Same objection, and also as calling for hearsay and not the best evidence.

(Deposition of J. W. Alvord.)

A. I am unable to say.

Q. 62. You have no recollection of the means you took of laying before Mr. Whittlesey the thing you wishes search upon?

By Mr. BROWN.—Same objection.

A. No, sir, not at this time.

Q. 63. Have you any recollection now of testimony given in the one prior suit in which you have testified that you did testify concerning these matters, to wit: "This pencil sketch is dated April 23, 1902, and signed by me in my own handwriting, both date and signature"? Have you any recollection now of giving such testimony or that sketch?

By Mr. BROWN.—Same objection. [331]

A. I have no recollection of giving such testimony but the fact which you read accords with the memoranda to which I have testified.

Q. 64. You don't now remember the sketch?

By Mr. BROWN.—Same objection.

A. I remember the sketch, yes, sir.

Q. 65. Do you know where that sketch is to-day?

By Mr. BROWN.—Same objection.

A. No, sir, I do not.

Q. 66. Do you remember what you did with it at the times mentioned in your prior testimony and mentioned by you this morning, namely, in April, 1902?

By Mr. BROWN.—Same objection.

A. Well, I think I filed that sketch, together with the other sketches testified to, and perhaps some other papers which I regarded as important, in

(Deposition of J. W. Alvord.)

some special way, because they are not in the regular file which I naturally would turn to.

Q. 67. Have you made an attempt to find any such special file, if there exist such?

A. No, sir, I have had no time to do any special searching—only looked at those things which were readily found.

Q. 68. If there is any such special file, it is in your office at the present time?

By Mr. BROWN.—Same objection.

A. It may be and it may be at my house. I would be unable to say. [332]

Q. 69. How long do you suppose a search would require to unearth such special file, if it exists,—how extensive a search would you have to make?

By Mr. BROWN.—Same objection.

A. I would be unable to state. My office has been in continuous operation for over thirty years; the accumulation of material in it is very great. A large amount of material has had to be packed and stored away for lack of space in the active, operating part of the office. Some of those back records were packed in boxes and taken out to my house; others were packed in compact form and stored in the back part of vaults, and it has been the practice of the office not to keep in the active files correspondence more than the prior ten years; and it would be very difficult for me to say where most of this material is at this time.

Q. 70. Is there anyone who, of your knowledge, could competently assist you in making such search?

(Deposition of J. W. Alvord.)

By Mr. BROWN.—Same objection.

A. I think not. There is no one in my office now who would be familiar with the papers in question.

Q. 71. Then am I or am I not correct in understanding that the present time, if such sketch of April, 1902, exists, you do not know of its whereabouts?

By Mr. BROWN.—Same objection.

A. I am unable to lay my hands on it at the present time. I feel almost certain that it is in my possession.

By Mr. BROWN.—Same objection.

A. I don't know at what place. [333]

Q. 73. Now, would it be possible for you now to make a rough reproduction of that sketch, or to make a sketch which, from your recollection, would show substantially the matter of such sketch of April, 1902?

By Mr. BROWN.—Same objection.

A. No, sir, it would not. That is, I would not be willing to take the chances of repeating a sketch which was prepared nearly twenty years ago—although I think I recall its general appearance and character. A photographed copy of this sketch was made at the time of this other litigation and I suppose was filed in that case to which I have referred.

Q. 74. Did you compare that photograph copy with the sketch which you yourself made?

By Mr. BROWN.—Same objection.

A. Well, I naturally presume that I had done so, but I could not testify absolutely to that.

(Deposition of J. W. Alvord.)

Q. 75. To your recollection, was it or was it not a correct photograph of that sketch?

By Mr. BROWN.—Same objection.

A. My natural inclination would be to say it was a correct copy of the sketch.

Q. 76. Well, have you recollection now—

A. —It was so accepted by both the parties in interest at the time.

Q. 77. Have you recollection now of its correctness—as to its correctness?

By Mr. BROWN.—Same objection.

A. No, I do not have any recollection. It is difficult for me now to even recollect very much about the sketch. [334]

Q. 78. Does there remain in your mind any recollection of the substance of this April, 1902, sketch which you could reproduce roughly by pencil and paper at this time, as to the general outline of parts, sufficient to give us an inkling of the structure portrayed?

By Mr. BROWN.—Same objection.

A. No, I would not attempt to do that, because I have not seen that sketch since the date of this litigation, presumably about 1911, and I would be afraid that my memory would fail me.

Q. 79. Referring, now, to Defendants' Exhibit "A-1," your patent No. 735,690, can you, by looking at same, recall any feature or part, or features or parts, thereof which were included or indicated in that sketch?

By Mr. BROWN.—Same objection.

A. Well, I have the recollection that this sketch

(Deposition of J. W. Alvord.)

was of the inclosed shaft and method of alignment, and that it was in all its main characteristics similar to the sketch produced in the patent, but I am unable to—

Q. 80. Which figure?

By Mr. BROWN.—Same objection.

A. Figure 1.

Q. 81. Then will you please state in your own language, in line with your last answer, what the parts were generally represented in that sketch, so that we may have it in your own words rather than by reference to the drawing of the patent.

By Mr. BROWN.—Same objection.

A. The parts of the sketch, so far as I can recollect them now, showed an outer casing of an ordinary deep well, a shaft in the center extending down to the pump, and a casing [335] inclosing the shaft, and a device for locking the inner casing surrounding the shaft in vertical alignment.

Q. 82. Do you recall, or do you not, anything pertaining to that sketch which has to do with the lining of the shaft or positioning it for service?

By Mr. BROWN.—Same objection.

A. Well, it had means showing for setting a wedge, when the shaft was in position, which would lock it in alignment.

Q. 83. Have you any recollection as to what the shaft turned in, and, if so, how those parts were arranged?

By Mr. BROWN.—Same objection.

A. The shaft turned inside of an inner casing which entirely surrounded it from top to bottom.

(Deposition of J. W. Alvord.)

Q. 83. And have you any recollection as to the bearings of the shaft?

By Mr. BROWN.—Same objection.

A. The bearings of the shaft were subject to another patent than the one we are discussing and were not shown in that sketch, but were shown in another drawing made in full and dated and signed by me as of May 1, 1902.

Q. 85. And do you know where that drawing is now?

By Mr. BROWN.—Same objection.

A. That drawing is evidently in the same file as the sketch we have been just discussing.

Q. 86. Can you state from recollection what the showing of that drawing of May 1, 1902, was, with respect to the mounting of the shaft or in any other respects in which you recollect it?

By Mr. BROWN.—Same objection. [336]

A. No, sir, I don't think I could without refreshing my memory. I recall that drawing No. 2, a reproduction of which appears from my minute was filed in the prior case in 1911, was essentially the drawing embodied in one of the simultaneous patents.

Q. 87. You mean one of those three which have been introduced in evidence here—Defendants' Exhibits "A-1" "A-2" and "A-3"?

By Mr. BROWN.—Same objection.

A. Yes, sir.

Q. 88. Will you kindly refer to these exhibits and select the patent to which you have referred.

By Mr. BROWN.—Same objection.



(Deposition of J. W. Alvord.)

A. It was a drawing essentially similar to the figure shown in the patent in Exhibit "A-2," patent 735,691.

Q. 89. Let me ask you again if you have any reason to believe that within the next week or two it would be possible for you to extend your search far enough to find this file in which you think these two sketches made by you probably are contained?

By Mr. BROWN.—Same objection.

A. I doubt it, as I have a large number of very important matters pressing on my attention just at this time, in which I am under contract to several large municipalities, and I feel that my time is not my own under those conditions. Given opportunity and time for examination, I am quite certain all these and other matters are subject to discovery in my files somewhere or other. [337]

Q. 90. Do you remember any other or further steps you took in connection with these matters of your three patents, copies of which are in evidence here as Defendants' Exhibits "A-1," "A-2" and "A-3"—next in order after the making of these sketches and drawings you have referred to?

By Mr. BROWN.—Same objection.

A. Not at this moment. There was undoubtedly a sequence of events, a record of which has been made, during the summer of 1902, leading up to the application for letters patent.

Q. 91. Have you any other recollection at this time of any such acts on your part?

By Mr. BROWN.—Same objection.

A. No, I have not, except that in a general way

(Deposition of J. W. Alvord.)

we pushed the matter continuously until the apparatus was built and was tested, and at the same time Mr. Whittlesey prepared the sketches and made applications for the patent, as shown by the record in the Patent Office.

Q. 92. Now, will you kindly state what the function and purpose of the inclosing tubing for the shaft was and the bearings for the shaft, as shown in the early sketches of the spring and summer of 1902.

By Mr. BROWN.—Same objection.

A. Well, so far as I can recollect about the matter, the inclosing casing around the shaft was designed to prevent grit or sandy sand from cutting the bearings; also to keep the rising water from eddying around the moving shaft.

Q. 93. Was or was there not any lubrication provided for or contemplated in these matters in the spring and summer of 1902?

By Mr. BROWN.—Same objection. [338]

A. The matter of lubrication was under consideration, and, to the best of my knowledge, I had at one time in mind that the space between the shaft and the casing, inclosing the shaft might be made the means of oil lubrication, but I became convinced that under the circumstances this was not necessary. I did not mention it in my patents, so far as my knowledge of the patents goes; I have not read them for many years.

Q. 94. For what reason did you believe that lubrication was not necessary?

By Mr. BROWN.—Same objection.

A. Because experience had seemed to show that

(Deposition of J. W. Alvord.)

water lubrication would be sufficient, particularly if the water was not impregnated with sand or grit or other substances which would injure the bearings.

Q. 95. Reading from your testimony in the other suit in which you have said you testified, in answer given by you to Q. 3, I quote as follows:

"Some time before August 1, 1902, I consulted with a mechanical draftsman and engineer named George W. Scott, who then had offices in the Rookery of Chicago, and employed him to prepare working drawings of a full-sized test pump to be built and operated for test purposes, but as nearly as practical of a size and character as could be later used for well purposes.

"The working drawing of this pump bears date August 21, 1902, and shows, first, a standard at surface having bearings and containing a shaft and pulley shown to be connected by belt to an electric motor. The shafting after leaving these bearings enters the elbow of the pipe used for conveying the water to the surface reservoir, this connection being through a water-tight joint. The shaft then passes down through the center of this water-pipe and is enclosed in the same by means of a surrounding casing extending from the top of the pipe to the pump at the bottom of the pipe, in such a manner as to completely exclude the water in the riser pipe from coming in contact with the shafting. At the bottom [339] of the riser pipe is shown an impellor pump attached to same, of the

(Deposition of J. W. Alvord.)

same type and detail as shown in Figure 25 of patent No. 735,692, issued to me August 11, 1903."

Will you state, please, whether you so testified in that other suit?

By Mr. BROWN.—Same objection.

A. I would not be able to testify that that was my testimony in the other suit. I have no copy of my testimony in the other suit; I have had no opportunity to know what I did testify in that suit with any certainty. The paper you hand me has all the appearance of being testimony given by me; that is all I can say, and, so far as you read it, has the appearance of an accurate description.

Q. 96. What, if anything, is your present recollection as to the matters in that testimony to which I have just directed your attention?

By Mr. BROWN.—Same objection.

A. I have very little recollection about that case, and I had completely forgotten that case at the time you parties called my attention to it here some few weeks ago.

Q. 97. With respect to the recitals in that testimony, what, if any, is your present recollection as to any part of it, namely, the part I have just read?

By Mr. BROWN.—Same objection.

A. Well, I should not like to give an opinion on that without the opportunity of a careful study.

Q. 98. We don't ask an opinion, but what your recollection is.

By Mr. BROWN.—Same objection. [340]

A. I should either ask that I be shown a certified

(Deposition of J. W. Alvord.)

copy of the testimony or be able in some way to identify it in my own office records, or have the opportunity to study and check it with what I know to be accurate and true.

Q. 99. Well, apart from that, have you any present recollection of any of the matters set forth in any of the testimony I have just read, and, if so, please state.

By Mr. BROWN.—Objected to for the reasons already stated, and for the further reason that the witness has already answered the question fully.

A. In a general way I remember the employment of Mr. George W. Scott, who prepared working drawings of a full-sized test pump. I have no recollection of the dates hereon but in a general way, as far as I can now recollect, the description of the pump would seem to me to be correct.

Q. 100. Have you any recollection as to the year when this pump last referred to was taken up between you and Mr. Scott?

By Mr. BROWN.—Former objection repeated.

A. Why, I am quite of the opinion that it was the year 1902, although I have no means of verifying that impression at this particular time.

Q. 101. Do you remember what, if anything, transpired in connection with this pump matter and Mr. Mr. Scott?

By Mr. BROWN.—Same objection.

A. No, I have no recollection about it, other than a general one that he was employed in the matter stated.

Q. 102. Quoting further from your testimony in

(Deposition of J. W. Alvord.)

answer to Q. 3, as given by you in the preceding suit,  
I read as follows: [341]

“The pump which was built from this drawing was installed in a power station at the yards of the Clearing & Transfer Company some time before the 1st of January, 1903, and the first test runs made of this pump were made January 2, 1903; it was thereafter tested with different types of impellers successfully for some six months, and was later presented to the University of Wisconsin for use in their hydraulic laboratory, where it now is.”

Did you or did you not so testify in that other suit?

By Mr. BROWN.—Same objection.

A. I should be unable to say. In a general way I know the pump was installed at the Clearing & Transfer Company yards and tested there for a considerable time, and was later presented to the University of Wisconsin. I might also add that it was made the subject of numerous tests by the University of Wisconsin and was the subject of a bulletin of considerable size published by them.

Q. 103. If these matters were continued for examination for a period of some ten days, would it be possible for you, after referring to a certified copy of your testimony and certified copies of exhibits introduced in evidence in connection therewith in the previous suit mentioned, to testify whether or not that was the testimony you gave in that suit?

By Mr. BROWN.—Same objection.

A. Why, undoubtedly, if I were presented with matters in the proper way, so that I could feel con-

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fidence from my recollection and knowledge that I was referring to an exact record of my testimony and exact duplicates of the exhibits, I could doubtless probably identify them as being such.

Q. 104. The principal object in the last question was to ascertain whether, at a time, say, ten days from date—or, to be specific, on the 23d of this month—you could conveniently appear before the present notary public and [342] make answer as to your previous testimony and the exhibits therein mentioned, if same were presented to you in certified form.

A. Witness again protests against the discourtesy of counsel in assuming that counsel's matters are predominating and controlling of the witness' time under the circumstances. There has been no attempt of counsel to consult with witness as to his disposal of his future engagements or his future contracts, or the pressing matters of his professional practice; and I am unable to say at this time whether I could or could not appear at any fixed date, fixed by counsel, as in the foregoing question.

Q. 105. My question aimed to exhibit courtesy and to arrange a time convenient to the witness hereafter to appear briefly and identify his previous testimony.

A. Witness insists that he has received no courtesy from the hands of counsel in this matter, and that he feels a very deep sense of the unfairness of counsel in the way and method and manner in which he has approached the whole subject, which obliged witness to testify to things about which he

(Deposition of J. W. Alvord.)

has had no opportunity to refresh his mind, which has seriously embarrassed his professional practice, obliged him to cancel most important and pressing engagements in which the vital interests of his clients are concerned.

Direct examination closed.

Cross-examination.

By Mr. BROWN.—The foregoing objections are here repeated to each of the questions asked and to the answers given, and notice is hereby given that motion will be made to strike [343] the entire deposition from the record as not being germane to the issues, as not being authorized under the order of the Master, and as being incompetent, irrelevant and immaterial to any issue joined in the cause.

Without waiving these objections, but insisting upon them, counsel asks the witness the following questions:

A.Q. 106. Referring to the 1902 machine and the invention set forth in your patent about which you have been interrogated on your direct examination, will you state whether or not you brought these, or either of them, to the attention of the Byron Jackson Machine Company or Machine Works, of Chicago and San Francisco, in the year 1902?

By Mr. BLAKESLEE.—Objected to as not cross-examination, calling for a conclusion on the part of witness, not a statement of facts, irrelevant, incompetent and immaterial.

A. I am unable to state whether the matter was brought to the attention of Byron Jackson Machine



Works in 1902. It was certainly brought to their attention later by me. It may have been brought to their attention in 1902. To the best of my knowledge and belief, it was brought in 1902, but I am unable to testify absolutely to the fact.

By Mr. BLAKESLEE.—We move to strike out the answer on each of the grounds stated in objection to the question.

Cross-examination closed.

(No cross-examination by Mr. Loftus.) [344]

By Mr. BLAKESLEE.—At this point an adjournment is taken until the hour at 10 o'clock A. M., Tuesday, February 24th, 1920, at the same place, at which time the present witness will be further interrogated as to the matter of his testimony given this morning and as to the testimony given by him in the other case in which he has testified he did testify, and as to such other matters as to which the present witness may be able to refresh his recollection during the interim. In the latter respects, would request the witness to make such further search as at all possible for the lost file or files, or misplaced file or files, or at present undiscovered file or files, or papers about which he has so far testified, and request him to be prepared on the 24th of this month to further testify in detail regarding these matters, and any matters to which his attention has been directed so far, and as to which he is at present unable to definitely testify.

The notary will now note an adjournment to the time and place mentioned, viz., 10 o'clock A. M., the 24th of February, 1920, before Hattie R. Lehman,

the present notary, and the witness is excused until that time and to appear at that time and place, viz., at Room 1503 Marquette Building, 140 South Dearborn Street, Chicago, Illinois.

By Col. BROWN.—The witness is here informed by opposing counsel that, in his opinion, this deposition is unauthorized under the present status of the case, [345] and that until he receives an order from the Master directing his deposition to be taken and directing him to make the search requested, he is under no obligation to make such a search or to spend any of his time at his own expense to elicit the information that defendants' counsel seems to be improperly seeking; that ample opportunity exists between now and the date mentioned for defendants' counsel to seek the proper order from the Master under whose authority these depositions were presumably taken, and to seek the enlargement of the scope of the order under which they were taken, if it be necessary to continue this hunting expedition; and that, in the opinion of counsel, the witness would be justified in refusing to accept the notice and to appear at the time and place mentioned and to give further evidence in this matter, unless instructed by the Court.

By Mr. BLAKESLEE.—Of course, counsel's statement is not testimony or evidence, and on its face it consists of an improper opinion which we do not understand to be competent for the Court to consider. We do not understand that in any respect this present witness is under the control or

direction of plaintiff's counsel, and we should assume that plaintiff's counsel would not wish that complexion to be put upon counsel's statements. The present witness is here under subpoena, and we stand upon the propriety of such procedure and insist upon the appearance of the witness [346] on the 24th of this month, as noted in now taking an adjournment. The witness is respectfully cautioned to appear at that time pursuant to the subpoena which has been served upon him in this matter. This is not a matter which counsel can opine about. The effect and force of such subpoena is a fact of more dignity and solemnity than counsel can have an opinion about. [347]

By Mr. LOFTUS.—In the case of Layne & Bowler Corporation vs. Western Well Works, Inc., et al., Equity 485, notice is hereby given that an adjournment will be taken until Tuesday, February 24th, at 10 A. M., to allow time for a certified copy of this witness' testimony, and exhibits in connection therewith, to be procured from the clerk of the court wherein the prior suit, in which this witness has testified, was filed. At the time mentioned, viz., February 24, 1920, the witness is requested to appear here before this same notary, at the hour of 10 A. M. whereupon the proceedings will be continued. He is cautioned that he is not excused under the subpoena but is expected to appear at the time noted and continue his deposition.

By Mr. BROWN.—Same objection. [348]

Tuesday, February 24, 1920, 10 o'clock A. M.

Parties met pursuant to adjournment.

Present: TAYLOR E. BROWN, Esq., Representing FREDERICK S. LYON, Esq., on Behalf of Plaintiff;

CLARENCE J. LOFTUS, Esq., Representing on Behalf of Defendants.

By Mr. LOFTUS.—Owing to the fact that the witness, John W. Alvord, is now engaged as a witness in another case in Chicago, in which the hearing is proceeding, known as the Chicago Telephone case, and states that it will be absolutely impossible for him to attend here this morning, and that he will not finish in the case in which he is now engaged until some time next Monday, it will be impracticable, if not impossible, for him to attend in the above-entitled cases until next Tuesday morning, March 2d, at which time he states he will be here and complete his deposition.

In view of this, an adjournment is therefore taken until Tuesday, March 2, 1920, at 10 o'clock A. M.

Tuesday, March 2, 1920, 10 A. M.

Parties met pursuant to adjournment. Present as before.

And thereupon an adjournment was taken until 2 o'clock P. M. on this day. [349]

Tuesday, March 2, 1920, 2 o'clock P. M.

Met pursuant to adjournment.

Present as before.

Thereupon the following proceedings were had.

By Mr. LOFTUS.—Notice is given that during

(Deposition of J. W. Alvord.)

or upon the completion of the examination of the witness, Alvord, the deposition of Mr. R. L. Otwell will be taken, in both the above-entitled cases, in behalf of the defendants.

JOHN W. ALVORD, recalled upon direct examination, testified as follows in answer to interrogatories propounded by Mr. Loftus:

R.D.Q. 107. Mr. Alvord, at the last meeting you were requested to bring in certain sketches, drawings and other data pertaining to your early work relative to deep well pumps. Have you with you such sketches and data? A. I have.

R.D.Q. 108. During your testimony heretofore in this case you were asked some questions which included quotations from what was alleged to be a copy of a former deposition given by you. In answer to some of these questions, your answers apparently were not positive and direct. Have you any explanation you care to make in this connection?

A. I was not at all satisfied that the copy of the deposition produced was, in fact, a full and complete copy, and upon being furnished with a certified copy I find, in [350] fact, that it was not a complete and full copy, and therefore I refuse to be bound by those quotations except that, so far as they were read to me, they seemed to be in accordance with the facts as I understood them.

(Deposition of J. W. Alvord.)

R.D.Q. 109. In order to get the facts regarding the early history of your work in connection with deep well pumps in a concise form, I wish you would please state fully the circumstances leading up to your early work on this line and describe fully the deep well pump invented or devised by you.

By Mr. BROWN.—Counsel inquires in behalf of Mr. Lyon whether it is the intention of the examiner to draw from this witness a statement of facts contrary to the statements made by the witness in the prior deposition which has been relied upon.

By Mr. LOFTUS.—No, not at all.

By Mr. BROWN.—If so, objection will be made to any attempt to vary the facts set up in that prior deposition.

A. The matter of the deep well pump was one which presented itself to my mind during the summer of 1901. There was obviously a need for better means for lifting water from deep artesian wells in Northern Illinois, and the region centering there, and there was no adequate apparatus at that time which would lift large quantities of water economically from such wells. My attention was first definitely called to the possibility of such an apparatus by a paper published [351] in the American Water Works Convention in the Summer of 1901, in which an attempt at Moscow, Russia, was the subject of a paper, and there was described there certain pumps inserted in wells for this purpose. It appeared to me, from a study of this paper, that these pumps were defective and could

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be improved upon, and during that year I revolved the matter over considerably. In about February, 1902, I was engaged by the President of the Chicago Clearing & Transfer Co., having large property interests southwest of Chicago and outside of the city limits, beyond the reach of any ordinary water supply, to investigate and report to him on the best methods of drawing water from wells in that neighborhood. I advised Mr. H. H. Porter, the president of the company, that this was a problem which was difficult because no appliance was then on the market which would adequately do this work, and that it was obviously desirable to invent and originate some appliance for the purpose. Mr. Porter encouraged me to look into the matter further, and on or about April 8th, as disclosed by me in former testimony at a former hearing, my diary shows that I adopted a definite idea for the purpose, and a day later disclosed this same to Prof. Daniel W. Mead, Professor of Hydraulic and Sanitary Engineering of University of Madison, Wisconsin. Sometime between the 8th of April and the 14th, I made certain sketches in a note-book in which I was recording investigations at Clearing for such a device. The first— There are three sketches in this note-book, and the first two of them I identify as being between the 8th and the 14th of April, 1902, because on the second page of the note-book I find the date reading as follows: "From Mr. Shire April 7, 1902," Mr. Shire being the [352] Chief Engineer of the Chicago Clearing & Transfer Co. at that time. On the page following

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the second sketch I find an entry reading as follows: "From Lawrence Machine Company April 17, 1902." The first of these sketches shows a horizontal section of a deep well with an inclosed shaft in the center, the shaft being 1 inch in diameter, the tube surrounding and inclosing the shaft being  $1\frac{7}{8}$  inches outside diameter, and the well being  $5\frac{3}{4}$  inches internal diameter. The apparent purpose of this drawing was to compute the area available for the flow of water after inclosing a shaft in the center of the well. The second sketch, two pages following in the same note-book, shows two vertical sections of a shaft and its inclosed casing. The section on the left shows the shaft with a coupling, an inclosed casing with the coupling, a bearing upon which the shaft revolves, and a screw device by which such inclosed shaft and casing can be adjusted so as to be vertical within a well whose walls are not exactly vertical. The drawing on the right also shows a vertical shaft, an inclosed casing with a shaft coupling, a casing coupling with interior screw coupling, and a wooden bearing upon which the shaft revolves. Sometime before April 23d—

R.D.Q. 110. Pardon me just a moment, Mr. Alvord. I wish you would describe the complete deep well pump that you had in mind at that time and the one that you explained to Daniel W. Mead, its manner of operation, and the general object you had in mind—what you were trying to accomplish—and how it operated. The sketches I notice are illustrative of certain parts. [353]

A. The apparatus which I had in mind at this



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time was an apparatus which was a deep well centrifugal or impellor pump attached to the lower end of a revolving shaft, which at its upper end was either belted to a motor or direct-connected to an electric motor. The size and character of the pump and the shaft in its inclosed tubing was such that it could be inserted in artesian wells of as low as 6 inches in diameter, and in wells from 100 to 200 feet deep if necessary, or of less depth. The purpose was to extract water from wells whose static level was considerably below the reach of suction lift at the surface of the ground, and it was the intention that such a pump and appliance should be adjustable, so that it could be lowered or raised as might be desired to reach the water without entering or digging down through the ground. It was also the purpose that the water rising in the well by means of the impellor pump should not come in contact with the shaft in any way, which would cause gritty water or sand to injure the bearings and cut them. It was also the intention to have an appliance which could be readily withdrawn from the well and examined and repaired. It was also the further intention to have a shaft and impellor which did not bear down upon any of the parts of the appliance, but which was floated on the rising water column by means of utilization of certain principles of hydrostatic pressure, thus eliminating friction and wear and tear.

By Mr. LOFTUS.—The two sketches referred to by the witness in the preceding answer are marked for identification as Defendants' Exhibit "A-4,"

(Deposition of J. W. Alvord.)

that being the first sketch, and Defendants' Exhibit "A-5," being the second sketch. [354]

By Mr. BROWN.—The exhibits are objected to as incompetent, irrelevant and immaterial, and also as not properly or fully proven.

R.D.Q. 111. Please refer to the sketches and data you have at hand relating to the early history of your deep well pump of the centrifugal type, taking them up in chronological order, and explain the apparatus disclosed in each of them, when they were made, by whom, and where.

A. The first sketch in question discloses a horizontal section of a well midway between the pulley or motor at the top and the pump at the bottom, and further discloses that there is a shaft down through the center of the well inclosed in a tube surrounding the shaft, protecting it from the water which is rising in the well due to the impellor pump at the bottom. This sketch in pencil was made by me in my own notebook on or between the date of April 7, 1902, and April 17, 1902. The book has been in my possession ever since those dates and no alteration whatever has been made to the original drawing and the figures surrounding it.

R.D.Q. 112. What title does this book have?

A. This book is entitled "Report on Water Supply for Chicago Clearing & Transfer Co., Summit, Ill., April, 1902."

R.D.Q. 113. Were all the entries in this book made by you, that you have referred to?

A. All that I have referred to, and all in the book with the exception of the last 20 pages or so, which

(Deposition of J. W. Alvord.)

are in the handwriting of my partner, Mr. C. B. Burdick, and relate to tests which he made on the pump after it was constructed.

R.D.Q. 114. Were all these entries made in this book, made by you, made at or about the date they bear or the date it appears? [355]

A. They were.

By Mr. LOFTUS.—The original sketch just referred to by the witness is offered in evidence as Defendants' Exhibit "A-4," and it is agreed that a photographic copy thereof, marked Defendants' Exhibit "A-4," may be substituted in lieu thereof for all intents and purposes; whereupon said photographic copy was so marked. The original sketch and book is submitted to the opposing counsel for examination.

By Mr. BROWN.—The exhibit is objected to as incompetent, irrelevant and immaterial, and also as not properly or fully proven.

R.D.Q. 115. Refer to the second sketch in this book and tell us what it illustrates, by whom it was made, and when and where.

A. The second sketch was made by me within the dates heretofore mentioned, of April 7, 1902, and April 17, 1902, and is partly in ink and partly in pencil. It refers to that portion of the apparatus situated midway between the motor at the top and the pump at the bottom of the well, and relates more particularly to the method of inclosing the shaft and keeping it in alignment while running, and the method of coupling the tubing together and of bearings for the shaft. This sketch was made

(Deposition of J. W. Alvord.)

by me at the time; it has not been altered in any way or touched, and has been always in my possession from that time to this day.

By Mr. LOFTUS.—The original sketch just referred to by the witness is offered in evidence as Defendants' Exhibit "A-5," and it is agreed that the photographic copy thereof marked Defendants' Exhibit "A-5" may be substituted in lieu thereof for all intents and purposes; whereupon said photographic copy was so marked, the original having been submitted to the opposing counsel for examination.

By Mr. BROWN.—Same objection.

R.D.Q. 116. Have you the original sketch to which you referred as being dated April 23, 1902, pertaining to your deep well? [356] A. I have.

R.D.Q. 117. Please refer to this sketch, explain what is there shown; and in doing so I wish, Mr. Alvord, that you would please put the reference character on the different parts when you name them.

A. This sketch is a pencil sketch showing that portion of the apparatus between the pump below and the motor above, midway down the well, and shows as No. 1 the shaft; number 2, the inclosed tubing of the shaft; number 3, the outer casing of the well; number 4, a device for locking the shaft in alignment; number 5, the coupling of the shaft. This sketch bears in my own handwriting the date "April 23, 1902, John W. Alvord."

R.D.Q. 118. When was that date put there?

(Deposition of J. W. Alvord.)

A. It was put there at the time the sketch was made.

R.D.Q. 119. When was that?

A. That was the day as just read, April 23, 1902.

R.D.Q. 120. And in whose writing is that?

A. That is my writing.

R.D.Q. 121. And who made the sketch?

A. I made the sketch personally.

R.D.Q. 122. And where has that sketch been since April 23, 1902?

A. It has never been out of my possession.

R.D.Q. 123. Was it recently taken from your files?

A. It was taken from the original file, put in a special envelope, where it has remained in a tin box in my possession ever since. [357]

R.D.Q. 124. Please tell us just what the operation is of the mechanism for holding the shaft casing and shaft in any desired position in the well casing.

A. The mechanism is designed to keep the shaft and shaft casing in perfect alignment, although it may be inserted in a well which is not in true alignment. For this purpose, the shaft and shaft casing, after being carefully aligned on the surface, is lowered through the well and at certain intervals of 8 or 10 feet there are hinged lugs, shown in the drawing as figure 4, which fall outward against the inside of the casing of the well. By raising and lowering the shaft within the shaft tubing an inch or two, the couplings of the shaft engage and lower or raise the key which locks the lug that abuts the outside casing of the well, so that when the shaft

(Deposition of J. W. Alvord.)

is in position the lugs are securely locked at each interval with such alignment as the well affords at that particular place.

By Mr. LOFTUS.—The sketch is submitted to counsel for plaintiff for examination, and is offered in evidence as Defendants' Exhibit "A-6"; and it is agreed that a photographic copy may be made by the Examiner and the blue-print substituted for the original.

By Mr. BROWN.—Objection to the last exhibit repeated as to this one.

R.D.Q. 125. Have you a photographic copy of "A-6" and a print thereof?

A. I have and I herewith produce it. [358]

By Mr. LOFTUS.—The photographic copy, Exhibit "A-6," just produced by the witness, is offered in evidence as Defendants' Exhibit "A-6," and it is agreed that it may be used in lieu of the original for all intents and purposes, the original having been submitted to the opposing counsel for examination.

R.D.Q. 126. I call your attention again to the book to which you have referred, entitled "Report on Water Supply for Chicago Clearing & Transfer Co.," and ask you to state whether or not there are any other sketches in that book pertaining to your deep well, centrifugal pump. If so, please refer to it and state what it shows, describing the construction therein illustrated and the manner of operation.

A. Another and third sketch occurs in the book, which is made in pencil and which shows that por-

(Deposition of J. W. Alvord.)

tion of the apparatus midway between the pump at the bottom and the motor at the top of the well. A vertical section of the shaft, the tube inclosing the shaft, the outer well casing, the hinged lug which abuts against the outer well casing and inside of the tube around the shaft, the key which locks the lug in place, and also the coupling on the shaft which, by raising the shaft one or two inches, disengages the key and unlocks the shaft and inner tubing from the casing, so that the inner tubing can be raised and lowered. There is also shown a section of the well—horizontal section—showing that there are three such hinged lugs at each locking section of the inner shaft and tube. The sketch is marked on the top, "Invention of apparatus for centering shafting in artesian wells, made by J. W. Alvord, Winona, May 20, 1902. Witness, [359] J. B. Davidson; Inventor, John W. Alvord."

R.D.Q. 127. What is the reason for that notification of the sketch and when was it put there and where?

A. At this time I had either in my employ or recently in my employ a draftsman named Mr. Metzger, who had become a patent attorney, and who advised me that all my sketches and drawings should be signed, dated and witnessed, if possible. At the date mentioned, May 20th, I was in the city of Winona, Minnesota, and testifying in an engineering case there on another matter. During the interval in waiting for my testimony, I made this sketch; showed it to Mr. J. B. Davidson, who was also a witness with me in the case, and was also

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waiting to testify, and asked him to sign it as a witness. And the matter wholly arose because I desired to discuss with Mr. Davidson and disclose my invention to him at that time, and drew the sketch for that purpose.

R.D.Q. 128. Did you disclose and describe to him then and there, on May 20th, 1902, your invention in deep wells of the artesian type? A. I did.

R.D.Q. 129. Is that his signature appearing on this sketch in this book which you have before you?

A. It is.

R.D.Q. What, if anything, did you say to him at that time as to how it should operate or would operate?

A. I described to him in detail how the appliance was intended to operate.

R.D.Q. And after describing it to him, he signed it as a witness? A. Yes, sir. [360]

R.D.Q. 132. Where has that sketch been since it was made?

A. This sketch is in pencil, in my own hand; it has not been altered since it was made; it was made on the date mentioned, May 20th, 1902, and the notebook in which it was made has been ever since in my possession from that time to to-day.

R.D.Q. 133. Do you know where J. B. Davidson is not located?

A. I do not know Mr. Davidson's address at the present time.

R.D.Q. 134. The last you heard of him was when?

A. The last I heard of Mr. Davidson was that he



(Deposition of J. W. Alvord.)

was City Engineer of Kenosha, Wisconsin, some years ago.

R.D.Q. 135. For the benefit of the Court I wish, Mr. Alvord, you would describe generally that book you now have in your hand, which you have referred to in a previous answer.

A. The book in which all of these sketches were made, and many other entries relating to the particular investigation of the water supply of the Clearing & Transfer, is a small blank note-book, quadrille-ruled, about 6 inches by 3½ inches in size, bound in red imitation leather, and marked on the outside, "Chicago Transfer & Clearing Co. Water Supply." It is a standard office note-book, such as has been used by me and my firm for the last twenty years, in entering notes of investigations and studies of engineering appliances.

R.D.Q. 136. And were all these entries appearing in this book kept in the regular course of your business entered about the date they bear? [361]

A. They were.

By Mr. LOFTUS.—The original sketch just referred to by witness is offered in evidence as Defendants' Exhibit "A-7," and it is agreed that the photographic copy thereof, marked Defendants' Exhibit "A-7," may be substituted therefor and used in lieu of the original for all intents and purposes; whereupon said photographic copy was so marked, the original sketch having been submitted to the opposing counsel.

By Mr. BROWN.—The exhibit is objected to as incompetent, irrelevant and immaterial, and also as

(Deposition of J. W. Alvord.)

not properly or fully proven.

R.D.Q. 137. I call your attention to a tracing which you have handed me, and I will ask you to state, if you know, what it illustrates, by whom it was made, when and where, and whether or not you ever used that tracing in disclosing the deep well pump designed by you to anyone, and, if so, whom.

A. This tracing which you now show me is a tracing which was made in my office in the Hartford Building by a draftsman under my direction, from an original scale drawing made personally by me. It discloses the final arrangement of my idea for inclosing the shaft and locking the shaft and inclosed tubing in a deep well by means of the devices outlined in the sketches heretofore described. The tracing is marked in my own handwriting, "Drawing of new device for centering shafting in artesian wells, invented by John W. Alvord, July 1, 1902." The tracing is further witnessed before a notary public, Mr. R. L. Otwell, on the date of [362] July 1, 1902, and is stamped with his notarial seal. This tracing has been in my possession, in my office, ever since that time and is unaltered from the time it was originally made. It discloses that portion of the apparatus midway between the pump at the bottom and the motor on the top of the well on the ground, and shows in vertical section a shaft, the tubing inclosing the shaft, the outer casing of the well, the hinged lug which drops against the outer casing, the key which locks the hinged lug in position, the coupling of the shaft which by riding the shaft engages the key and

(Deposition of J. W. Alvord.)

locks and unlocks the hinged lug, and a bearing between the shaft and the inner tubing made of a movable wooden wedge adjusted by a setscrew. There are also two horizontal sections showing that there are three such lugs at each interval, and there are also two horizontal sections showing the arrangement of the bearing within the inner tubing.

R.D.Q. 138. What, if anything, did you say to Mr. Otwell at the time of showing him that drawing, when it was acknowledged before him as notary public, and what connection did Mr. Otwell have with you at that time?

A. Mr. R. L. Otwell at that time was entering the practice of law and had office room in my office, and was doing part of his time stenographic work for me. I disclosed to him at that time that this was an invention which I had developed for the apparatus of deep well pumps and the alignment and protection of shafting by inner tubing, and asked him to put the proper notarial certificate and sealing upon the drawing as witnessing to those facts.

R.D.Q. 139. And he did so acknowledge it on that date? A. He did. [363]

By Mr. LOFTUS.—The original tracing which has just been referred to by the witness, and acknowledged before a notary public on July 1, 1902, is offered in evidence as Defendants' Exhibit "A-8," and it is agreed that a blue-print thereof, marked Defendants' Exhibit "A-8," may be substituted therefor for all intents and purposes, whereupon said blue-print was so marked. The original tracing to which the witness has just referred is submitted

(Deposition of J. W. Alvord.)

to opposing counsel for examination.

By Mr. BROWN.—The exhibit is objected to as incompetent, irrelevant and immaterial, and also as not properly or fully proven.

R.D.Q. 140. I call your attention to the blue-print which has been marked as Exhibit "A-8" and will ask you to describe the construction there illustrated, giving a reference character to the different parts.

A. Referring to the vertical section of the shaft marked 1, the tubing inclosing the shaft marked 2, the outer casing of the well marked 3, the hinged lug engaging the outer casing of the well marked 4, the key which locks the hinged lug in place marked 5, the coupling of the shaft marked 6, the wooden bearing between the shaft and the inner casing marked 7, the setscrew adjusting the wooden bearing marked 8; referring again to the two horizontal sections, I mark the shaft in both cases as 1, the inner tubing in both cases as 2, the outside casing of the well in both cases as 3, the hinged lug engaging the outer casing in both cases as 4, and the key locking the hinged lug in place in both cases [364] as 5; and referring to the two horizontal sections of the bearing, I mark the shafting in both cases as 1, the inner tubing around the shafting in both cases as 2, and the bearing in the lower section as 3 and the setscrew adjusting the bearing in the upper of the two sections as 4.

R.D.Q. 141. The blue-print of Exhibit "A-8," which you have just marked, is an exact reproduction of the original tracing, is it not? A. It is.

(Deposition of J. W. Alvord.)

R.D.Q. 142. Did you ever have the device illustrated in Exhibit "A-8" patented in the United States? A. I did.

R.D.Q. 143. When was it patented and what is the number of the patent?

A. A patent application was filed November 17, 1902, and granted August 11, 1903, as No. 735,690.

R.D.Q. 144. If you have any further drawings or sketches pertaining to this deep well devised by you, please refer to them, describing the construction illustrated in each of them, telling when and where they were made and by whom.

A. On the 1st of May, 1902, I made a drawing of the lower part of the apparatus known as the impellor pump. This drawing was traced by a draftsman in my office, under my direction, and the original tracing which I produce here was marked by me in my own handwriting, "Balanced Deep Well Pump designed and patented by John W. Alvord, Sanitary Engineer, Chicago, May 1, 1902." The tracing shows the impellor pump marked 2, the shafting reaching up to the surface marked 30, the inclosing tubing around the shafting marked 17, and an outer casing marked 12. [365]

R.D.Q. 145. When was that made?

A. This drawing was made by me on the date of May 1, 1902, and has been in my possession, in my office in the Hartford Building ever since, and has not been altered in any way save that some time subsequent to the issuance of the patent the numbers of the patent drawing, describing the different parts, were copied upon the tracing by my draftsman.

(Deposition of J. W. Alvord.)

R.D.Q. 146. To which patent do you refer?

A. I refer to patent 735,691, issued August 11, 1903.

R. D. Q. 147. Have you here a blue-print of the tracing? A. I have.

R. D. Q. 148. In whose handwriting is the description on the original tracing?

A. It is my handwriting.

By Mr. LOFTUS.—The original tracing referred to by the witness is offered in evidence as Defendants' Exhibit "A-9," and it is agreed that a blue-print marked "A-9" may be substituted therefor for all intents and purposes. The original is submitted to opposing counsel for examination.

By Mr. BROWN.—The exhibit is objected to as incompetent, irrelevant and immaterial, and also as not properly or fully proven.

R.D.Q. 149. Have you any other drawings, Mr. Alvord, that refer to the early history of your deep well, centrifugal pump?

A. Some time prior to August, 1902, I employed a mechanical engineer by the name of Mr. George W. Scott, [366] having offices in the Rookery in Chicago, to make a working drawing of a full-sized pump as near as practicable to that which would be needed for artesian well installation, for the purpose of testing the invention. This working drawing was produced by him as of date of August 21, 1902, and the blue-print which I here have is a blue-print of the original tracing, which is not now in my possession but retained in the files of Mr. Scott.

(Deposition of J. W. Alvord.)

R.D.Q. 150. Do you know where Mr. Scott is now?

A. I do not. The drawing shows a frame at the surface of the ground holding the upper end of the shaft and to which is attached a pulley with belt and arrow-marked motor. The shafting thus driven passes down through the pipe corresponding to the well casing and the shafting is inclosed in a tube surrounding it, so as to prevent the water rising through the casing from coming in contact with the shaft or its bearings in any way. The lower part of the left-hand drawing discloses a cross-section of the impellor pump which was so designed as to float upon the rising water column by admitting the hydrostatic pressure below certain portions of the pump.

R.D.Q. 151. Has that particular blue-print which you have in your hand been in your possession continuously since August 21, 1902?      A. It has.

R.D.Q. 152. Had you, prior to that time,, disclosed and described to Mr. George W. Scott, at Chicago, Illinois, the entire construction and manner of operating of your deep well centrifugal pump, concerning which you have been testifying?

A. I had. [367]

R.D.Q. 153. And from that disclosure he made this drawing of which the blue-print you now hold is an exact copy?      A. He did.

By Mr. LOFTUS.—The blue-print just referred to by the witness is offered in evidence as Defendants' Exhibit "A-10," and it is agreed that the photographic copy marked "A-10" may be substituted

(Deposition of J. W. Alvord.)

in lieu thereof for all intents and purposes.

By Mr. BROWN.—Same objection.

R.D.Q. 154. Have you tried to locate George W. Scott, who made one of these drawings?

A. Yes, sir.

R.D.Q. 155. Without success? A. Yes, sir.

R.D.Q. 156. What is the size of the original blueprint to which you have just referred—the size of the sheet, approximately? A. 17x23.

R.D.Q. 157. What is the size of the photographic copy? A. About 10x8.

R.D.Q. 158. So that in making the photographic copy they reduced the size of the drawing?

A. They have.

By Mr. LOFTUS.—The original is submitted to opposing counsel for examination.

R.D.Q. 159. Were there any other features of this deep well pump patented, and, if so, when and what was the number of the patent? [368]

A. There was a still further patent, No. 735,692, granted on August 11, 1903, showing the pump at the bottom of the shafting with somewhat different shaped design of impellor, but showing the same shafting and inclosed tubing of the shafting within the well casing.

R.D.Q. 160. In all these arrangements, at the very outset, as I understand, you had a driving shaft as a shaft which drove the centrifugal pump, which shaft ran up above the surface with a pulley on the upper end for the purpose of operatively connecting with some kind of motive power, and this shaft was housed by means of a shaft casing or tubing.



(Deposition of J. W. Alvord.)

A. Yes, sir.

R.D.Q. 161. Then outside of that shaft casing or tubing was the well casing?      A. Yes, sir.

R.D.Q. 162. That was true in all instances?

A. Yes, sir.

R.D.Q. 163. In every sketch and drawing from the very outset; and that is shown in every patent?

A. Yes, sir, it is shown in every drawing.

R.D.Q. 164. Before applying for an application for patent on your deep well pump, what, if any, correspondence did you have with your then patent counsel?

A. Some time prior to the 23d of April, 1902, I wrote to Mr. George P. Whittlesey, patent attorney, Washington, D. C., and asked him to make a search in the Patent Office for the state of the art. On April 23, 1902, I received a reply from Mr. Whittlesey's assistant, Mr. Whittlesey being absent at that time giving a report and sending me copies of patents which disclosed the then state of the art. [369]

R.D.Q. 165. Have you the letter which you wrote Mr. Whittlesey?      A. No, sir, I have not.

R.D.Q. 166. Have you searched for it?

A. Yes, sir.

R.D.Q. 167. Been able to find it?

A. Not been able to find it, because apparently the correspondence of that date has not been kept in the office.

R.D.Q. 168. Have you the letter received from Mr. Whittlesey reporting on the search?      A. I have.

R.D.Q. 169. Will you produce those letters, please?

(Deposition of J. W. Alvord.)

A. I herewith produce them.

R.D.Q. 170. I call your attention to the two letters, one dated May 3, 1902, and the other April 23, 190—.

A. The first letter, apparently the stenographer omitted the final "2" of the 1900. The second letter shows that the date of May 13, 1903.

R.D.Q. 171. Which letter was received first?

A. The letter dated April 23, 190—.

R.D.Q. 172. In that letter he states: "Your recent favor in regard to Improved Pump for Artesian Wells, etc., came duly to hand." To what did he refer?

A. He referred to a letter which I had written to him disclosing my invention and asking for information as to the state of the art, asking for a search.

R.D.Q. 173. In your letter did you disclose and describe the deep well centrifugal pump concerning which you have here been testifying?

A. Yes, sir. [370]

R.D.Q. 174. And it was on that device that he made his preliminary search? A. Yes, sir.

By Mr. LOFTUS.—The two original letters are offered in evidence as Defendants' Exhibit "A-11," and it is agreed that the copies marked Defendants' Exhibit "A-11" may be substituted therefor for all intents and purposes. The exhibits are submitted to opposing counsel for examination.

R.D.Q. 175. This is the same Whittlesey who later acted as your attorney in obtaining your three patents for you, to which you have referred?

A. It was.

(Deposition of J. W. Alvord.)

R.D.Q. 176. To what extent, Mr. Alvord, have deep well pumps been manufactured and sold in the United States, embodying the features described and claimed in your patent 735,690?

By Mr. BROWN.—Objected to as immaterial.

A. They have been sold and used extensively in the rice fields in Louisiana, in the irrigated districts of Florida, in the artesian well belt of the Chicago Central District of the County, and at other water-works throughout the country.

R.D.Q. 177. You referred to a drawing which has been marked Defendants' Exhibit "A-10," as illustrating a deep well centrifugal pump and complete operative connections, which drawing I believe you stated was made for the purpose of testing these apparatuses? A. Yes.

R.D.Q. 178. Was that apparatus built and tested?  
[371]

A. The apparatus was built as drawn by Mr. Scott, and was tested at the Clearing & Transfer Co.'s yards in December of 1902.

R.D.Q. 179. Where was that—Chicago, Illinois?

A. Just outside of and southwest of the city limits of Chicago.

R.D.Q. 180. How did the construction which was tested in December, 1902, just outside of Chicago, Illinois, compare with the construction illustrated in Exhibit "A-10"?

A. The drawing was precisely followed in the construction.

R.D.Q. 181. And with what success did it operate? A. It operated with complete success.

(Deposition of J. W. Alvord.)

R.D.Q. 182. I believe you stated in your testimony that you disclosed your deep well centrifugal pump to Daniel W. Mead. Where and when did you make your first disclosure to him, and substantially how was it described to him?

A. The extract from which I read in my prior testimony from my diary, as of April 8th, mentioned "Talked to Mead." I recall that Prof. Mead came into my office on or about that time, and that I described to him fully what I had in mind in the way of deep well pumping apparatus, inclosed shafting and balanced impellor. I had prior to this time talked to Prof. Mead from time to time about the need for such an appliance and the advantages of it.

R.D.Q. 183. Did you use any sketches or drawings in describing this to him at that time?

A. I don't recall whether I did or did not. [372]

R.D.Q. 184. He understood it from your description? A. Yes, sir, he understood it.

R.D.Q. 185. In this deep well pump of yours, can the piping in the pump be all assembled in proper shape before inserting it in the well, and was that your intention from the outset?

A. Yes, sir, it was. The whole assembly can be made on the surface of the ground and the pump can be inserted in a tubular well.

R.D.Q. 186. Can the pump be placed in any desired position in the well and there held?

A. It can.

R.D.Q. 187. And what means have you provided for that, to accomplish that result?

A. By shortening or lengthening the shafting and

(Deposition of J. W. Alvord.)

tubing which is built in sections and come together.

R.D.Q. 188. And what actually holds it in the particular position in the casing?

A. The hinged lugs and the locking key, which are operated as I have heretofore testified.

R.D.Q. 189. Can it be raised and lowered by manipulation from the surface? A. It can.

R.D.Q. 190. And can the length of the piping leading from the pump to the surface be adjusted?

A. It can, by removing sections, as I have heretofore described.

R.D.Q. 191. And is the centrifugal pump operated from the point above the surface?

A. It is. [373]

R.D.Q. 192. In your device shown in your patents, and in all the sketches to which you have referred, from the very outset, did you illustrate a pump casing—that is, did you have a pump casing in mind or illustrate one? A. I did.

R.D.Q. 193. Did you have in mind or illustrate a rotary pump? A. I did.

R.D.Q. 194. Did you have a closed casing surrounding the pump and shaft? A. I did.

R.D.Q. 195. Did the casing surround the shaft from the top of the well? A. Yes, sir.

R.D.Q. 196. Have you had any negotiations with anyone connected with the Layne & Bowler Company relative to your three patents which have been offered in evidence here as Defendants' Exhibits "A-1," "A-2" and "A-3"?

By Mr. BROWN.—Objected to as immaterial.

A. I have.

(Deposition of J. W. Alvord.)

R.D.Q. 197. Just tell us fully what the negotiations were and when they took place and what was said and done; who represented the Layne & Bowler Co.?

A. On the 2d of February, 1920, Mr. J. B. Harmon, whose card left with me shows him to have been sales engineer of the Layne & Bowler Co. with headquarters at Memphis, Tenn., called at my office and took up the matter of my patents in connection with his own company's operation. Mr. Harmon represented that, in his opinion, Messrs. Layne & Bowler were [374] developing their ideas in the Patent Office on or about the time when I was at work similarly in developing my ideas. Mr. Harmon inquired what I would expect to receive for my patents in the matter and I named him a price of \$5,000. Thereupon he asked me if I would give him a short option on that amount, and I gave him a thirty-day option for the purchase of the patents. Mr. Harmon represented to me that those patents would be quite valuable to his company; that they were doing a large business in the sale of these pumps, amounting, as he said, to some \$3,000,000 per year, and that the rice industry could not have been promoted without the use of the pumps in question and the improvements which they and I had made. He further stated that if the Layne & Bowler Co. should own my patents they could undoubtedly collect royalty from other companies who were using the same, and that he could recommend to Mr. Layne promptly the purchase of my three patents. Whereupon I had written out my

(Deposition of J. W. Alvord.)

proposition in writing, signed it and gave it to him on that date.

R.D.Q. 198. Have you got a copy of that proposition or letter? A. I have.

R.D.Q. 199. The letter just handed me by the witness. This is a carbon copy of the proposition you dictated, signed and delivered to J. E. Harmon, Sales Engineer, Layne & Bowler Co., on February 2, 1920? A. It is.

By Mr. LOFTUS.—The copy is offered in evidence as Defendants' Exhibit "A-12," and it is agreed that a copy marked Exhibit "A-12" may be substituted in [375] lieu thereof for all intents and purposes. The plaintiff is called upon to produce the original in the event any objection is made to the use of the copy.

By Mr. BROWN.—Same objection.

R.D.Q. 200. What, if anything, did Mr. Harmon say as to the Layne & Bowler Co. infringing these patents of yours which have been offered in evidence here?

By Mr. BROWN.—Same objection; irrelevant and immaterial.

A. I don't recall that he admitted other than as I have stated, that he felt that Layne & Bowler were developing their ideas in the Patent Office a little later, but at nearly the same time as I was developing mine. He gave me to understand that he felt that my ideas were, perhaps, a little earlier than Messrs. Layne & Bowler's.

R.D.Q. 201. In this apparatus which you disclosed to Mr. Mead and others, and particularly to

(Deposition of J. W. Alvord.)

Mr. Otwell on July 1, 1902, as shown by defendants' Exhibit "A-8," does that construction comprise a combination of a well casing, a line shaft for the pump closed off from the water in the well?

A. It does.

R.D.Q. 202. What did you do with that pump you tested out at the Clearing place?

A. That was presented to the University of Wisconsin and is now in Prof. Mead's hydraulic laboratory.

By Mr. LOFTUS.—I think that is all. [376]

By Mr BROWN.—The objections first noted to the deposition of this witness are here repeated, and the notice of motion to strike the deposition from the file, for the reasons before stated, is here repeated.

Cross-examination waived.

Deposition closed. [377]

**Deposition of R. L. Otwell, for Defendants.**

R. L. OTWELL, a witness produced on behalf of the defendants, being first duly sworn, testified as follows:

Direct Examination by Mr. LOFTUS.

Q. 1. Your name? A. R. L. Otwell.

Q. 2. Residence? A. Chicago, Illinois.

Q. 3. Occupation? A. Lawyer.

Q. 4. Were you, during the years 1903 and '03, associated with J. W. Alvord, the witness who just preceded you in this case? A. Yes, sir.

Q. 5. In what capacity?

A. I rented an office of him, beginning May 1,



(Deposition of R. L. Otwell.)

1902, and as a consideration for that office I agreed to do his stenographic work.

Q. 6. So that at that time you were in pretty close touch with him?

A. At that time I was simply a stenographer.

Q. 7. But you knew what was going on?

A. I knew what was going on; yes, sir.

Q. 8. Did he disclose and describe to you a deep well of the centrifugal type, which he claimed to have devised during 1902, and, if so, when and how did he describe it to you and what did he use? [378]

A. I had heard more or less talk in the office of his ideas on a deep well pump, and on July 1st he came to me with a tracing and explained that it was in connection with a deep well pump—a method of aligning the shaft of a deep well pump—and asked me to put an acknowledgment or an affidavit, some way of perpetuating some testimony of his efforts thus far.

Q. 9. I call your attention to an original tracing which was produced here by Mr. Alvord and offered in this case as Defendants' Exhibit "A-8," and ask you to examine it and state what you know about it.

A. That is the tracing, and in the corner of it there I put an acknowledgment, and Mr. Alvord acknowledged it before me, and I put my seal on it as a notary public, on July 1, 1902.

Q. 10. Is the affidavit in your handwriting?

A. That is all in my writing; yes.

Q. 11. And does your seal appear upon it?

A. That is my notary seal.

(Deposition of R. L. Otwell.)

Q. 12. And in whose handwriting is the inscription at the right of the affidavit?

A. That is Mr. Alvord's handwriting.

Q. 13. Is the blue-print which has been marked in the case in lieu of the original tracing an exact reproduction thereof except for the characters the witness has affixed in red pencil.

A. It appears to be an exact blue-print of the other with the exception of the red figures additional in the blue-print. [379]

Q. 14. The affidavit on the original in your handwriting and your signature and the inscription to the right of it are all in ink, are they not, on the original tracing? A. They were in ink.

Q. 15. And the tracing is done in ink?

A. Yes, sir.

Q. 16. Did you understand at the time this was shown and described to you, when you took Mr. Alvord's acknowledgment on July 1, 1902, that there was to be a centrifugal pump near the bottom of the well and that the shaft must be driven by some motive power above the surface?

By Mr. BROWN.—Objected to as leading.

A. Yes, sir.

Q. 17. So that you fully understood—

A. Well, I wouldn't say that I fully understood it, but I understood that much of it.

Q. 18. You understood the aligning arrangement of the shaft?

A. Yes, sir, I thought I did that.

By Mr. LOFTUS.—I guess that is all.

By Mr. BROWN.—No cross-examination.

Deposition closed.

Whereupon an adjournment was taken subject to further notice, and this ends the proceedings before the present notary. [380]

State of Illinois,

County of Cook,—ss.

I, Hattie B. Lehman, a notary public in and for the county of Cook and State of Illinois, duly commissioned and authorized, and residing in said Chicago, County of Cook and State of Illinois, do hereby certify that the foregoing depositions of John W. Alvord and R. L. Otwell were taken before me as notary public, commencing at the hour of 5 o'clock P. M., Wednesday, February 11, 1920, and were taken and continued until completed at the times and places noted in the record; that the plaintiff was represented by Frederick S. Lyon, Esq., and Taylor E. Brown, solicitors and counsel or representing counsel for plaintiff, as noted on the record, and by William A. Loftus, Esq., solicitor and counsel for defendants; that said John W. Alvord and R. L. Otwell were duly sworn by me before the commencement of their depositions, to tell the truth, the whole truth and nothing but the truth, in accordance with law; that the foregoing depositions and proceedings thereon were taken stenographically by me and by me thereafter reduced to typewriting in agreement with my stenographic notes thereof; that the foregoing depositions and record thereon are a true, full, correct and complete transcript of the depositions of said witnesses, John W. Alvord and R. L. Otwell, and of all proceedings had and taken in connection therewith, and which commenced at Room 1503 Marquette Building, 140

South Dearborn Street, Chicago, Illinois, at the time hereinbefore mentioned; that each of the exhibits mentioned in the foregoing depositions and the proceedings thereon, as offered in evidence, was [381] duly offered in evidence as appears in the record, and is attached hereto and included within this certificate; that the witnesses read over their foregoing depositions, respectively, and signed the same in my presence afterward; that I am not connected with or related in any manner, of interest or otherwise, to any part or either of the parties to this litigation, by either blood or marriage, nor in any event interested in the outcome or event thereof; and that it is my intention, upon this 5th day of March, 1920, to duly seal up the foregoing depositions and the said exhibits, that I may transmit the same under my seal and under this certificate to the Hon. Clerk of the United States District Court, San Francisco, California.

Given under my hand and notarial seal this 5th day of March, 1920.

[Seal]

HATTIE B. LEHMAN,

Notary Public.

[Endorsed]: Filed Apr. 19, 1920. W. B. Maling, Clerk. By J. A. Schaertzer, Deputy Clerk. [382]

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(Title of Court and Cause.)

**(Stipulation and Order as to Use of Certain  
Depositions.)**

IT IS HEREBY STIPULATED AND  
AGREED by and between the parties to the above-

entitled suit that, in order to save time and expense, the defendants above named may, upon the trial of this suit, use as evidence herein with the same force and effect as if taken *de bene esse* or given in open court in this suit any or all of the testimony heretofore given by Franklin H. Jackson and H. C. Robb in the case of this same plaintiff vs. American Well & Prospecting Co. et al., now pending in the United States District Court, for the Southern District of California, Southern Division, In Equity—No. E-42, together with the accompanying exhibits (or photostats or other true copies of said exhibits), forming part of said depositions of said Frank H. Jackson and H. C. Robb.

IT IS FURTHER STIPULATED AND AGREED that either a copy of said depositions and exhibits certified by the official reporter, or such copies as may be agreed upon by counsel as correct copies shall be deemed a full and sufficient certification as to the correctness thereof and that no further certification thereof shall be required to render the same admissible in this court under this stipulation.

FREDERICK S. LYON,  
WILLIAM K. WHITE,

Attorneys for Plaintiff.

CHAS. E. TOWNSEND,  
WM. A. LOFTUS,

Attorneys for Defendants.

So ordered.

FRANK H. RUDKIN,

Judge.

Dated May —, 1920.

[Endorsed]: Filed May 6, 1920. W. B. Maling,  
Clerk. By J. A. Schaertzer, Deputy Clerk. [383]

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In the United States District Court, for the South-  
ern District of California, Southern Division.

IN EQUITY—No. E-42.

LAYNE & BOWLER CORPORATION,  
Complainants,

vs.

AMERICAN WELL & PROSPECTING CO. et al.,  
Defendants.

**Deposition of Frank Jackson, for Defendants.**

Before Hon. LYNN HELM, Special Master, at  
Los Angeles, Beginning January 6, 1920.

APPEARANCES:

FREDERICK S. LYON, Solicitor for Complain-  
ants.

CHARLES C. MONTGOMERY and RAYMOND  
IVES BLAKESLEE, Solicitors for Defend-  
ants.

Direct Examination of FRANK JACKSON.

(By Mr. BLAKESLEE.)

Q. State your name, age, residence and occupa-  
tion, Mr. Jackson.

A. Franklyn H. Jackson, past sixty-three of age,  
residence, 2309 Brooklyn Avenue, Los Angeles;  
occupation, designer and manufacturer of cen-  
trifugal pumps.

Q. How long have you been engaged in that line

(Deposition of Frank Jackson.)

of manufacture and work, Mr. Jackson?

A. Since 1884 or '85.

Q. And prior to your location in Los Angeles where, if at any other place, were you engaged in that business?

A. In San Francisco, prior to the fire; and after the fire and earthquake over in West Berkeley for about two years.

Q. What was the name of the concern or interest with whom or through whom you did business in San Francisco?

A. Byron Jackson Machine Works, and, also, for a short time I think, before that—I can't say just how long—known as the Byron Jackson Agricultural Works.

Q. When did the name change to the Byron Jackson Machine [384] Works?

A. I am not quite sure, but I think somewhere about 1901.

Q. Do you know who the proprietors of the Byron Jackson Machine Works were?

A. At *that* Mr. Byron Jackson was the sole proprietor.

Q. Are you any relation to him?

A. I am his cousin.

Q. Do you know where Mr. Byron Jackson is today?

A. I understand he is residing in Berkeley.

Q. Is he engaged in any business?

A. I think he has retired from business.

Q. Now, what was the business of Byron Jackson Machine Works in the year 1901, specifying

(Deposition of Frank Jackson.)

what they turned out at the works?

A. Steam engines, boilers, centrifugal and turbine pumps, and some agricultural machinery.

Q. What were the pumps designed for? For what kind of service?

A. For irrigation, principally.

Q. What was the general nature of the irrigation pumps made at that time?

A. The first pumps *the* manufactured were what is commonly called horizontal centrifugal pumps, and that was followed very shortly after with what is known as vertical or pit pump, pumps that were placed in the bottom of a pit and operated with a shaft extending to the bottom of the pit.

Q. Were these made to some quite considerable extent in 1901 by Byron Jackson?

Mr. LYON.—Objected to as leading and suggestive.

Q. (By Mr. BLAKESLEE.) To what extent were they made at that time? [385]

Mr. LYON.—We object to that question. The dates are one of the material things in the case, and we object to counsel placing the date in the mouth of the witness.

Mr. BLAKESLEE.—He says it was in 1901.

The MASTER.—He says they were engaged in business in 1901. It might not be material.

Q. (By Mr. BLAKESLEE.) During the commencement of the business of the Byron Jackson Machine Works, what was the general nature of the irrigating pumps that were turned out there?



(Deposition of Frank Jackson.)

A. Do you refer to the time they began to make irrigating pumps?

Q. Yes, sir.

A. What was called the vertical pit pump and also the horizontal pump.

Q. When were the vertical pit pumps first turned out there?

A. About four years prior to 1901, we began to manufacture the pumps. We had been manufacturing about four years probably up to 1901.

Q. And some of those were vertical pit pumps?

A. Yes, sir; and some were horizontal pumps.

Q. What was the general nature of the vertical pit pumps? How were they made up, briefly stating the parts?

A. They very nearly resembled—I will show you the nature of them in a catalog.

Mr. LYON.—I think the witness had better describe it.

The MASTER.—What is that paper you have?

A. This is an old leaflet from an old catalog. It only goes to illustrate.

Q. When was that printed?

A. That was printed about that time; one of the very first [386] we got out.

Q. (By Mr. BLAKESLEE.) A catalog by the Byron Jackson Machine Works?

A. Yes, sir; this was gotten out probably in 1888 or somewhere along there.

Mr. BLAKESLEE.—We would like to introduce it to show the state of the art.

The MASTER.—He is talking about a time with-

(Deposition of Frank Jackson.)

in four or five years of 1901.

A. This type of vertical pump was manufactured prior to the time that I made an invention of a pump known as the Byron Jackson automatic balancing pump, that is about my idea of the dates of those things, because the other pumps that I will talk about later were made about that same time. The vertical pump was very similar to the horizontal pump, with a shaft extending to the top of the pit, which was sometimes twenty feet and sometimes fifty or seventy-five feet, and operated with a pulley with a quarter turn belt at the top of the well. The water was taken in in the Byron Jackson pumps through an elbow and what we called a suction yoke in the top of that pump.

Q. And what was it that did the lifting of the water?

A. It was done by what we call the impeller or runner which was a hollow revolving disc with curved arms, receiving water at the center and throwing it out by the operation of centrifugal and impact force.

Q. What confined the water and conducted it to the mouth of the well?

A. It was discharged into what was called the pump shell, a volute shell increasing in size, and then with an elbow turning up to the surface and conducted up with the pipe. That is what was called the pit pump. [387]

Q. At any time while you were with the Byron Jackson Machine Works in San Francisco, were any changes made to your knowledge, in the design-

(Deposition of Frank Jackson.)

ing and construction of these vertical pit pumps?

A. Yes, sir.

Q. When was any such change made?

A. In the pit pump, the change in the pit pump was made—we made what was called the automatic balancing pump. I can fix that pretty well in my mind. We were having trouble with balancing the rotating parts in the pit pump, and I made what proved to be an invention on May 3, 1899.

Q. (By the MASTER.) What was your connection with the Byron Jackson Company?

A. Foreman and superintendent.

Q. Did you actually do work, or did you just simply guide the men?

A. I guided the men and superintended the work, inspected the drawings when they came to the shop and approved the drawings before they were put in the shop or in the pattern-shop, in order to know that they could be made without difficulty and that they would not be made so as to do impossible things and also, for constructive purposes, to make it economical in construction.

Q. (By Mr. BLAKESLEE.) Did you inspect the work when it left the shop, to see that it was mechanically perfect? A. Yes, sir.

Q. How long did you continue that work with the Byron Jackson Machine Works?

A. Until 1908.

Q. What, briefly, was the nature of the change which you introduced in the vertical pit pump in 1898 or '99, I believe you said? [388]

A. I made what was known as the automatic bal-

(Deposition of Frank Jackson.)

ancing pump, a pump balanced by a variable pressure chamber, the pressure controlled by lateral motion of the shaft, which was the subject of a suit later on between the United Iron Works of Oakland and the Byron Jackson Iron Works of San Francisco, and then still later, between the Byron Jackson Iron Works and the Krogh Manufacturing Company of San Francisco.

Q. What, if any, connection is there between the Byron Jackson Iron Works and the Byron Jackson Machine Works?

A. It was reincorporated after the fire and changed from the name of Byron Jackson Machine Works to the Byron Jackson Iron Works, and at that time they increased their capital. They were incorporated for \$250,000.00, and they raised it to \$500,000.00.

Q. To your knowledge, were any other changes made in the construction of the vertical pit pumps turned out by the Byron Jackson Machine Works, between 1899 and 1908? A. Yes, sir.

Q. What was the nature of such change and when was it introduced?

A. Mr. Byron Jackson, who was always looking out for improvements in machinery and designs of all kinds, conceived the idea of making a pump, first conceived for domestic purposes, to put into a bored well, to be operated from the surface of the ground.

Q. What, if anything further to your knowledge, was done after his conception of such things?

A. We made a small model of the pump in the

(Deposition of Frank Jackson.)

early part of—well, the latter part of 1899 or early part of 1900.

Q. Right at this point, what, if anything, were the duties of Mr. Byron Jackson at that time? Did he take an active part in any way in the Byron Jackson Machine Works? [389]

A. Yes, sir.

Q. What was his office, or his position?

A. As proprietor. He acted also as consulting engineer and devised many of the appliances that we used in the shop.

Q. Do you know what his condition is to-day, physically and mentally?

Mr. LYON.—The question calls for a yes or no answer as to whether he knows.

A. I have not seen him for a number of years.

Q. (By Mr. BLAKESLEE.) What was the nature of this experimental pump of 1899 or 1900, following Mr. Byron Jackson's conception?

A. We made a pump in a bowl form or what is now known as the bowl form, having a runner taking water in at the bottom of the bowl, and a discharge pipe extending vertically, with a Tee at the top, out of which we discharged the water, and at that time we used what we called a top pulley frame as we had not designed anything in the way of a pump. We used one of our top pulley frames at the top of the shaft. The shaft extended from the runner—by the way: I made a sketch of that if I could show it to you.

Q. I suggest that you first verbally describe it and then refer to the sketch.

(Deposition of Frank Jackson.)

A. There was a bearing placed just above the runner, held in place by four arms which were cast into the shell or the bowl in order to sustain the rotating parts of that pump. Mr. Jackson secured a ball-bearing, consisting of a cup and cone similar to what was used on a bicycle. The shaft was in the neighborhood of seven-eighths of an inch in diameter. This little ball-bearing was set right on top of the bearing in the pump bowl. We set this up in the shop, having a tank under the lower [390] fall and discharged the water in a small box on the upper floor, and then allowed the water to return back into the tank on the lower floor. We first began to drive the pump at a comparatively slow speed—I should judge about perhaps a thousand revolutions—and failed to deliver any water due to the small diameter of the runner or impeller. Then we began to speed it up, and we changed pulleys and increased the speed till we ran it somewhere between 1600 and 1800 revolutions per minute, and then pumped water—quite a nice little stream, and, in order to find out as to whether it would work all right, we ran the pump about a day at high speed and it began to rattle and show signs of something going wrong with the bearings or something, and we took the pump down and took it apart and discovered that the ball bearings had pretty nearly worn out, as it was running in the water and the water had failed to lubricate the ball bearings at all.

Q. Now, through what device or in what manner

(Deposition of Frank Jackson.)

was the water conducted to the surface in the operation of this device?

Mr. LYON.—We object. We ask that the witness be asked to describe as fully as he can remember, the bowl of this device before counsel suggests to him that there is any other part in the device.

Mr. BLAKESLEE.—He said water was delivered, and I am asking how it was delivered by this pump.

The MASTER.—How is water delivered by this pump?

A. Through this discharge pipe extending from the top of the bowl. The shaft was operating inside of this discharge pipe, and then it was discharged through a Tee at the top of the pump, and the shaft projected on through a stuffing-box at the top and the pulley was above that that operated the pump.

Q. (By Mr. BLAKESLEE.) You have referred to a certain [391] sketch you made. How did you come to make that?

A. I made it from memory of the thing when I began to study on the thing, and I remembered that definitely because I had much to do with getting the thing together.

Q. When did you make that sketch, and where?

A. I made that sketch here in Los Angeles.

Q. When? A. A few days ago.

Q. Can you produce it now? A. Yes, sir.

Q. Please do so.

Mr. LYON.—We will object to the witness producing the sketch unless he has first completed his

(Deposition of Frank Jackson.)

testimony in regard to the mechanical construction of the device. The counsel has fully brought out all that he contends there was in this construction—

Mr. BLAKESLEE.—As far as I know, he has described it. Have you anything further to tell us as to the construction of this 1899 and 1900 device built along the conception of Mr. Byron Jackson? A. No further than—

Q. I mean as to the way it was constructed?

A. No.

Q. Do you know where that mechanism is now, or what became of it? If so, state.

A. It was destroyed in the fire, but some time before that when we discovered that the ball bearing was a failure by attempting to lubricate it with water, we decided that it was necessary to lubricate it in some way, and so Mr. Byron Jackson suggested that we put in a 1- $\frac{1}{4}$  inch pipe from the outside of the shell into the bearing and put an oil cup on the outside. [392]

Q. (By the MASTER.) Was that done?

A. No, sir; it was not done and for this reason: that I simply suggested to Mr. Jackson that it would be useless to put oil into that bearing open in the water, for the reason that the oil would simply float up through the bearing in the water and disappear, and then the suggestion came to Mr. Jackson or myself, I think perhaps at the same time, that we put a tube around that and put the oil into that tube and protect the bearing by that.

Q. (By Mr. BLAKESLEE.) Put the tube where?



(Deposition of Frank Jackson.)

A. Around the shaft, and extend it to the top of the bearing.

Q. What, if anything, was done in that connection?

A. As soon as we conceived that idea, Mr. Jackson says we will make a larger one. This pump is too small to get that tube in, and he ordered the drawings made for a large size of that same type of pump, and then, in order not to have the speed excessive, we made it, as I remember, with about three stages.

Q. Please explain what you mean by "three stages."

A. For instance, one stage, placed immediately above the other, the water being delivered from one stage to the other all the way up, throwing the water out from the center and using centrifugal force, and by means of the bowl returning it to the center.

Q. Now, as to the drawing you refer to that Mr. Byron Jackson had made, who made that drawing, if you know? A. Mr. Vandergrift.

Q. Where was that drawing made?

A. It was made in the drawing-room of the Byron Jackson Machine Works at that time.

Q. What would you place as the date of the making of that drawing? [393]

A. The drawing was made, I am reasonably certain, at the end of 1900, or perhaps, about the middle of 1900.

Q. Do you know where Mr. Vandergrift is today?

A. They said he went to Heaven. He is dead.

(Deposition of Frank Jackson.)

Q. What was Mr. Vandergrift's position there?

A. Draftsman and designer.

Q. How long was he there? Do you know the period of his employment?

A. I think Mr. Vandergrift was there about two or possibly three years, but I am not sure about that.

Q. Were there any other draftsmen there?

A. Yes, sir.

Q. Mention any by name.

A. Mr. Howard Thomas was there.

Q. Do you know where he is now?

A. I believe he is in Oakland. I have not heard from him or seen him for several years.

Q. What were his duties there?

A. At that time he was assistant draughtsman and tracer.

At the request of Mr. Blakeslee, a suspension of proceedings was had for a few minutes. During the time while proceedings were suspended, the witness is looking at a slip of paper.

Proceedings being again commenced, proceedings were resumed as follows:

Mr. LYON.—I object to the witness looking at sketches until his testimony is completed.

A. I explained to you the pump by two or three stages, one delivering the water to the other. I have a blue-print in my pocket that would illustrate that if you would care to see it.

The MASTER.—Go on with the description.

Q. (By Mr. BLAKESLEE.) To your knowledge, did you have [394] anything to do about the drawings which were connected with this pump or

(Deposition of Frank Jackson.)

well mechanism, with the tubing around the shaft?

A. Yes, sir.

Q. What did he have to do with it?

A. He made the tracings and blue-print of the drawing that was drawn by Mr. Vangergrift.

Q. Do you know where that tracings and blue-print are to-day?

A. In the possession of the Byron Jackson Iron Works in San Francisco.

Q. Did you see them at the time they were made?

A. Yes, sir.

Q. How close was that time to the time that Vandergrift made the original drawing?

A. Within a few days. Sometimes the tracings were back three or four days, but it was all within a week.

Q. Please go over each and every part that you recollect of the second pump mechanism you have discussed, namely, the one proceeding from Mr. Byron Jackson's conception in the latter part of 1900, as you fix it, and give us a summing up of its construction and its operation.

A. I got that date pretty clearly in my mind or that time pretty clearly in my mind within a month or so, for the reason that at that time I made my own patent device, or which was afterwards patented, and was operating it, and had it on the same tank with which we tested this pump. The pump was made, I think, with three stages. I would not be absolutely sure of that; possibly it was four stages. The water was taken in at the bottom and discharged by the runners at the peripheries, and

(Deposition of Frank Jackson.)

returned to the center of what was commonly called the pump bowl, and delivered successively to each one of the runners and [395] finally at the top shell it was discharged into what was called the outer casing, and carried to the surface and discharged through a cast-iron Tee, made especially for it—discharged horizontally very similar to the one that I described in the small model. Now, the tube that we had suggested on the little pump, extending from the upper bearing of the top shell of the pump, or top bowl, to the surface and through the discharge elbow at the top of the pump, then was made water-tight by a stuffing-box outside of this tube. The shaft of the pump extended up through this tube to the surface, or to the upper bowl similar to the little one that I described, and was operated by means of a pulley on the shaft, on what we call an A frame. About midway up in this discharge pipe we put a joint in the pipe and at that joint we put what we call the spider, which was a bearing having three extended arms extended within about an inch of the discharge pipe or casing, and tapped into the ends of those arms there was a screw. The object of that screw was to center the bearing up in the casing. The hubs on either end of this spider were threaded and the tube was threaded on the inside, and screwed on to this spider. The spider was cast iron, and where the cast projected, that was larger than the shaft and then the bearing proper was Babbitt metal. In order to insure the oil floodings the upper end of that bearing, we extended a small brass tube about a quarter of an inch in diameter,

(Deposition of Frank Jackson.)

or about three-eighths or a half an inch, so that it would be sure to flood the upper end of the bearing with oil before it ran through. Then, midway between this spider and the pump, we put in another bearing similar to this spider, but without any extending arms, and likewise above that spider, between there and the discharge. The upper end of the tube was open, the shaft extending through it, and we placed an oil cup on one side of the frame and ran a pipe over [396] to the top of this tube and dropped the oil down into the tube. At the lower end of the tube, just below what we called the upper bearing of the pump, we put a stuffing box. This stuffing-box was formed by threading the inside of what was called the stuffing-box chamber and what is known by mechanics as the gland was threaded externally and screwed into this stuffing box, tightening up the hemp packing or flax packing, I don't know what it was—whether it was hemp or flax—with a view of keeping the water from going into the lower end of the tube, and also to keep the oil from coming out. This pump we operated for quite a while. In fact, the pumps sat up there for quite a long time—I should say several months; I cannot say just exactly how long.

Q. Now, please state how the bearings were mounted—these three bearings you have mentioned, one at the spider, one above it and one below it? How were they mounted and arranged in place?

A. They were threaded—if I am allowed to use that model, I could make it clear. It would be very similar to having a babbitted sleeve so that

(Deposition of Frank Jackson.)

it fitted the shaft, and threaded externally on either end to within an inch of the center, and then the tube threaded on the inside and screwed on to these bearings. That was what we called the intermediate bearing.

Q. And where the spider was provided, what was the mounting of the bearings?

A. I have already described that, but it was similar to the sleeve, with this exception; that in that case we used three lugs extending out to within about an inch of the pipe, and screws were tapped into them so that they could be backed out and jammed against the casing and thus made it possible to center the shaft in the tube as we went along.  
[397]

Q. What I meant was, what was the relation of the intermediate bearing and the spider?

A. The purpose was to keep the bearings in alignment to support the shaft.

Q. Was that intermediate bearing part of the spider, or separate?

A. Separate from the spider entirely.

Q. Where was this well mechanism you last described, set up?

A. In the shop of the Byron Jackson Machine Works, in San Francisco.

Q. What arrangements were made for providing it with water to deliver, and where was the water delivered?

A. We had a tank about eight feet in diameter, set below the lower floor of the shop, and we extended the pipe up through the second floor and discharged

(Deposition of Frank Jackson.)

it into a weir-box there, and dropped it down through another pipe into this tank, so that we used the same water over and over again.

Q. Now, with reference to the floor level, where were the bowls of the pump located?

A. The bowls of the pump were lowered into the tank below the lower floor.

Q. How much below?

A. The tank was four feet deep and they were slightly above the bottom.

Q. You said that mechanism was operated there for several months. Why did you discontinue its operation, or what became of it?

A. They took the pump down in order to use it for exhibition purposes, to show how it was constructed, with a view of showing possible customers.  
[398]

Q. You mean to display its working parts?

A. Yes, sir; and furthermore, to examine as to whether it got loose, or if there was anything to change.

Q. What did you find?

A. Nothing at all. It was almost identical with the pumps that we made from there on.

Q. How long did it remain there at the Byron Jackson Machine Works?

A. That particular pump was destroyed in the fire. That is, it was badly melted, and parts of it bent up so that it was put into junk.

Q. That was in the big fire of April, 1906?

A. Yes, sir.

Q. And to your knowledge it was destroyed then?

(Deposition of Frank Jackson.)

A. I know it was destroyed.

Q. You have stated that it was used for demonstration purposes and it was taken down and disconnected. What was done in that respect, if you can tell us a little further?

A. When a salesman had a prospective customer, he would bring him into the shop and show him how it was operated and how it was constructed and so forth.

Q. To your knowledge, were any pumps or well mechanisms like that well mechanism just described, sold by means of such demonstrations?

Mr. LYON.—We object to that as leading and suggestive and calling for a conclusion of the witness, incompetent and not the best evidence, no foundation laid for the introduction of secondary evidence

The MASTER.—The objection will be sustained. You can ask him what was done with these pumps.

Q. (By Mr. BLAKESLEE.) Suppose I ask him this: after this [399] pump you have just described was taken down and used for demonstration purposes, were sales of well mechanisms made by the Byron Jackson Machine Works while you were there? A. Yes, sir.

Q. Were any of them similar to this mechanism which was used for demonstration purposes?

Mr. LYON.—We object to that on the same ground.

Q. (By Mr. BLAKESLEE.) There were pumps, you say, sold after that demonstration?

A. Yes, sir; numbers of them were sold prior to the fire.



(Deposition of Frank Jackson.)

Q. What were those pumps like?

A. Almost identical to the pump I have described. Some of them were made larger and some smaller, and some with several stages and some with only two.

Q. Can you specify now any differences between the pumps sold and the pump used for demonstration purposes?

A. So far as the general construction is concerned, including the tube and bearings, they were identical.

Q. Do you recollect now or have you any knowledge now as to the identity of any purchaser of any pump so sold? A. Yes, sir.

Q. Please state.

A. They were sold—the first that we made,—I won't say the first but we made pumps that were sold to the Pabst Brewing Company of Milwaukee.

Q. When were those pumps made?

A. Those pumps were made in 1902, I think.

Q. How many of them were sold to the Pabst people?

A. Five, during my time.

Q. And the first was made in 1902?

A. To the best of my recollection. [400]

Q. Do you know that such pump was shipped from the Byron Jackson Machine Works?

A. Yes, sir; the pump was shipped with the bearings and headwork, from our works. The tubes and the shaft and the casing were purchased and put together in the east by our employee.

Q. Who was that?

Q. (By Mr. LYON.) Did you see that installation after the pumps left your shop at any time?

(Deposition of Frank Jackson.)

A. In Milwaukee?

Q. Yes, sir.

A. No, sir; not after it left San Francisco.

Mr. LYON.—We move to strike out the answer from the record and all the testimony of the witness in regard to the construction of any such alleged pump after the same left the shop of the Byron Jackson Machine Works, on the ground that it is hearsay, incompetent and not the best evidence.

Mr. MONTGOMERY.—He has testified that certain things were shipped from San Francisco. He knows that of his own knowledge. There is no hearsay about that.

The MASTER.—He moves to strike out after it was shipped.

Mr. BLAKESLEE.—We consent to that motion.

Mr. LYON.—I mean all that portion of any statement of anything that was purchased except what he knows himself.

Q. (By Mr. BLAKESLEE.) What was it that was missing in the shipment of this first pump or well mechanism, sent from San Francisco?

A. We did not ship the outer casing, the tube, or the shaft. We shipped the bearings, the couplings, the headworks and the pump complete, so far as they were concerned up to that point.

Q. You have spoken of some one who had something to do [401] with the installation; who was that? A. Mr. H. C. Robb.

Q. What was his employment?

A. Erecting engineer.

(Deposition of Frank Jackson.)

Q. Of what concern?

A. The Byron Jackson Iron Works or Byron Jackson Machine Works.

Q. To your knowledge, what did he do in this connection about installing this first patent pump?

Mr. LYON.—Of your own knowledge.

A. I know nothing further than I have stated, that we shipped the parts and that he was instructed to put them in.

Q. (By Mr. BLAKESLEE.) Do you know anything about his movements in that connection?

A. Nothing except that he left our works and went back there to do the work.

Q. Back to Milwaukee?

A. Yes, sir; and when he returned he came to us bringing the check for the payment of the first pump, and orders for three more.

Q. What was the date of his departure from San Francisco for Milwaukee in that connection?

A. In 1903, I think.

Q. Do you know what time of the year?

A. I cannot recall it now.

Q. When did he return with the check for that first installation and the order for three more pumps for the Pabst people?

A. I think that was in the latter part of 1903 or very early in 1904.

Q. Do you remember any other particular orders for [402] vertical pit pumps which were filled after the commencement of use of this pump for demonstration purposes—that is the pump built in

(Deposition of Frank Jackson.)

accordance with the Byron Jackson conception of 1903?

A. You mean the pit pumps or the bored well pumps?

Q. Vertical deep well pumps.

A. This type that we are discussing?

Q. This or any type.

A. We built pit pumps and are building them to this day, and also turbine pumps.

Q. Do you remember any orders for such turbine pumps.

A. Yes, sir; we built some that went to Waterloo, Iowa.

Q. When was that?     A. 1904.

Q. What was the nature of that mechanism?

A. Identical with that described.

Q. You mean the demonstration pump that you have spoken of?     A. Yes, sir.

Q. Do you know whether in connection with the preparation of the work for the filling of this first order for the Pabst people, when drawings were made?     A. Yes, sir.

Q. Who made such drawings?

A. Mr. Vandergrift.

Q. And did anybody else do anything in connection with such drafting work?

A. Mr. Howard Thomas.

Q. What did he do?

A. He traced them and made blue-prints.

Q. You are referring to the same Vandergrift and Thomas that you referred to before. [403]

A. Yes, sir.

(Deposition of Frank Jackson.)

Q. Where was that work done?

A. In San Francisco.

Q. At the same shop?      A. Yes, sir.

Q. Do you know where such drawing or drawings is or are now?

A. They are in Byron Jackson Iron Works, in San Francisco.

Q. Are any of the drawings you have mentioned within your control at the present time?

A. No.

Q. When did you last see them?

A. I saw them a couple of months ago.

Q. Both the drawings of 1900 or the latter part of 1900 and this drawing in connection with the Pabst first order?

A. Yes, sir; and also the drawing—I am not quite sure about the drawings for the Pabsts, but I think I saw the ones for the Pabst and also the ones for the Waterloo order.

Q. Those drawings that you saw, tell us, please, what was the nature of those drawings, prints, tracings, original drafting or what?

A. The original drawing was made and sent to Mr. D. W. Meade and who I understood was the consulting engineer, and it was sent there with a bid offering to build that type of pump, and for his approval.

Q. That is, the drawing you mean for the first Pabst installation?      A. Yes, sir.

Q. And what was it you saw a couple of months ago at San Francisco?

A. I saw them there. [404]

(Deposition of Frank Jackson.)

Q. Was it that drawing that you saw?

A. Yes; I saw that drawing and two or three others.

Q. How about the tracing that Mr. Howard Thomas made of the drawing of this first Pabst installation? When did you last see that and where?

A. The last time I saw that was about 1906, just about the time prior to the fire.

Q. What became of it, if you know?

A. All of the drawings in a few hours before the fire, we took all the drawers out of the cabinets, with all our tracings and loaded the drawings up on a truck and took them to the northern part of the city, and, fearing that they might be burned, they were buried in the sand there. But the fire did not come within about two blocks of where they were buried.

Q. After the danger was over what was done, if anything?

A. They were then taken over to Oakland. They opened at temporary office in Oakland *the* the drawings were taken there.

Q. Did this lot of drawings include also the first drawing you mentioned of 1900?

A. Yes, sir.

Q. When did you last see the tracings you said Mr. Howard Thomas made?

A. It was a little prior to 1906.

Q. Please state again what finally became of this first well mechanism with the ball-bearings?

A. That was destroyed in the fire.

Q. As well as the one that followed it?

(Deposition of Frank Jackson.)

A. Yes; we took that down when we set the other one up.

Q. When was this drawing made, the drawing for the first patent installation?

A. That is the drawing that we sent back there for approval. [405]

Q. For Mr. Mead's approval?

A. That was made very early in 1900, according to my recollection.

Q. Was it your custom or not to keep in touch with the drafting department where Vandergrift and Howard Thomas worked at the shops?

A. Yes, sir.

Q. Now, having described to us this first well mechanism of 1900, please produce the sketch you refer to as having been made by you last week or a few days ago. (The witness produces a sketch.)

Q. Will you kindly designate on this sketch the several leading parts you have referred to, including the shaft, ball-bearings and so forth, writing the names of the parts on using leading lines to the parts? (The witness marks the sketch as directed).

Mr. BLAKESLEE.—We offer this in evidence as Defendants' Exhibit 1, sketch by the witness Frank Jackson, and ask that the same be so marked.

Mr. LYON.—I would like to ask what it is supposed to be of.

Mr. BLAKESLEE.—As part of his testimony.

Mr. LYON.—He said he made a sketch of something, but I don't know that he said what it was.

The MASTER.—He was asked if he had prepared a sketch for the pump that they made in 1901.

(Deposition of Frank Jackson.)

Mr. BLAKESLEE.—This is another one. That was a blue-print. This is of the first one with the ball-bearings.

The MASTER.—This is the sketch he made?

Mr. BLAKESLEE.—Yes.

The MASTER.—And there he was requested to stop.

Mr. BLAKESLEE.—Yes; and I have asked him to mark the [406] parts on it.

Mr. LYON.—This is a sketch, then, of the one with the ball-bearings that was made?

A. Yes, sir; for the experimental pump; the very first thing we made.

Mr. BLAKESLEE.—I will ask another question. This exhibit 1, Mr. Jackson, is the sketch you referred to in your earlier testimony here, namely, the one which shows the ball-bearing pump mechanism made in 1900 and which was tried out for a while prior to the shaft in the tubing.

Mr. LYON.—We object to that as leading and suggestive. It absolutely states the dates and everything else. I want to know what the witness has to say about it and not what Mr. Blakeslee says.

Mr. BLAKESLEE.—We withdraw the question. Please tell us what this sketch shows, and connect it up with any part of your previous testimony which it illustrates or refers to.

A. This sketch Exhibit 1 refers to my earlier testimony in reference to the first experimental pump that we made for bored wells.

(By the MASTER.)

Q. And is that the one that was not a success?



(Deposition of Frank Jackson.)

A. The one with the ball-bearings. It was not a success from the fact that the ball-bearings went out with the water.

Q. (By Mr. BLAKESLEE.) Now, please tell us a little further where this well mechanism which was the first one, with the tubing enclosing the shaft and which was used after having been set up in 1900, as you say, and later taken down and used for demonstration purposes, as to the shaft itself? How was that shaft made?

A. The shaft was what was ordinarily called cold-rolled [407] or turned shaft and was coupled together by means of left-handed threads and screwed couplings, the couplings being about four inches long, and the shells threaded about two inches on each end.

Q. How many pieces were there to the shaft?

A. The shaft is usually made in twenty-foot lengths.

Mr. LYON.—I move that that answer be stricken out.

The MASTER.—That is not the question. How many pieces were in that shaft and how many couplings?

A. There were only two lengths of shafting used in the first pump, and two couplings.

Q. You have spoken of a blue-print in your testimony? A. Yes, sir.

Q. Will you produce that, please?

(The witness produces a blue-print.)

Q. What does that blue-print show?

A. It shows the construction that I described

(Deposition of Frank Jackson.)

similar to the Pabst pump. This one, however, shows the pump which was sent to Waterloo, Iowa. It is almost identical and perhaps identical with the Pabst pump.

Q. Can you point out any particulars in which the disclosure of this blue-print disagrees with the construction of the mechanism shipped to Waterloo?

Mr. LYON.—We object to that as leading and suggestive.

The MASTER.—He has described that Waterloo construction.

Mr. LYON.—But here is a blue-print. We don't know when it was made or by whom, placed before the witness. It is not proven to be one of the old blue-prints or anything else. You can prove any kind of a defense if you are permitted to do that.

The MASTER.—I sustained an objection to this because I thought he had already described his Waterloo machinery as being identical with the Pabst machinery. Now, then, the blue-print [408] has not been presented yet. You cannot describe the machinery again.

Q. (By Mr. BLAKESLEE.) I am asking where it disagreed with that and I will have him identify the print. He said it was substantially the same.

The MASTER.—Yes; that is the answer. That is enough.

Mr. BLAKESLEE.—I was simply carrying it a little further so as to differentiate, if there were any discrepancies.

Q. Where did you get this blue-print?

(Deposition of Frank Jackson.)

A. I got it here in Los Angeles.

Q. Where?

A. In the office of Mr. Johnson—The American Well and Prospecting Company's office.

Q. When?

A. The last time I was up here.

The MASTER.—Since Monday?

A. Yes, sir; all the same day.

The MASTER.—You were here Friday?

A. Yes, sir; that is when I got it.

Q. (By Mr. BLAKESLEE.) Now, does that compare with the construction of the well mechanism which was first shipped by the Byron Jackson Machine Works to the Pabst people at Milwaukee?

Mr. LYON.—We object to that as incompetent, not the best evidence, leading and suggestive, no foundation laid for the introduction of secondary evidence and a mere conclusion of the witness.

Mr. BLAKESLEE.—He has described that mechanism and I want to tie this up, and go through and have him identify every part.

The MASTER.—I don't think that you ought to ask these questions and ask him how that compared with him. I think he has described the other machinery. You can offer it in evidence [409] and let it be subject to comparison.

Q. (By Mr. BLAKESLEE.) Please state what this blue-print shows.

Mr. LYON.—We object to that on the ground that it is incompetent, no foundation laid, the witness not having qualified to answer the question,

(Deposition of Frank Jackson.)

and as irrelevant and immaterial, unless it is shown whether this is one of the original blue-prints made at the time, or a mere reproduction from memory by someone who has produced it and handed it to the witness.

Mr. BLAKESLEE.—He can state what it shows.

The MASTER.—He simply says he got it here at this pump company's office.

Q. (By Mr. BLAKESLEE.) I am asking from his knowledge what it shows.

The MASTER.—He can state whether he ever saw that before.

Q. Have you ever seen any drawings like this before or any device like this before?

A. Yes, sir.

Q. What device.

Mr. LYON.—Objected to as incompetent, not the best evidence, not the proper method of proof, calling for a conclusion of the witness.

Mr. BLAKESLEE.—He stated he had no original drawings in his control.

The MASTER.—He said he knew where they were.

Mr. BLAKESLEE.—But that they were not under his control. In due time he will produce them, but I want this witness' testimony to be illustrated.

Mr. LYON.—If there is an original of that print, it is easy enough to prove it right.

Mr. MONTGOMERY.—It is not the original.

[410]

Mr. LYON.—That is one of the things we will

(Deposition of Frank Jackson.)

show in this case. It is attached to this man's affidavit in this case, and that is why we want strict proof. I want to know where it is that his memory has been refreshed by this outside print.

Mr. BLAKESLEE.—You can ask about it on cross-examination. I want it used as part of a deposition to illustrate his testimony. I can ask him to describe this or to refer to this and point out the parts, but I want something concrete before your Honor as well as his verbal testimony.

The MASTER.—Don't you think you have to lay a better foundation as to why he has not the original before him?

Mr. BLAKESLEE.—He said they were not in his control. I was careful to ask him that.

The MASTER.—Don't you think you have got to show where the others are?

Q. (By Mr. BLAKESLEE.) Do you know where the drawings and tracings are as you have referred to as having been made by Vandergrift and Thomas?

A. In the possession of the Byron Jackson Iron Works.

Q. Are they available to you at the present time?

A. They would if I asked for them.

Q. But you have to go there to get them?

A. Yes, sir; or write for them.

Q. (By the MASTER.) Where did this piece of paper come from? When was it made, do you know?

A. This is the reprint of the tracing sent from the east to our office in Los Angeles.

(Deposition of Frank Jackson.)

Q. Whereabouts in the east? Do you know of your own knowledge where it came from?

A. Simply this, I know that it came in the mail to our office. [411]

By Mr. BLAKESLEE.—From where?

A. From the east. It came from Daniel Meade. It was in his envelope or in an envelope having his name on it, and this is a reprint of that.

Q. (By the MASTER.) You never saw it before? A. No.

Mr. BLAKESLEE.—But he recognizes this.

A. Yes, as a copy of the original.

Mr. BLAKESLEE.—We will waive this inquiry with the understanding we reserve the right to recall this witness to identify those drawings. That is the reason why I asked yesterday that this witness' testimony be deferred until we can obtain those drawings.

The MASTER.—You don't think yourself you could introduce a copy like this without any better foundation?

Mr. BLAKESLEE.—I don't propose to use it in the place and stead of the original at all.

The MASTER.—Then the objection is that you are leading the witness.

Mr. BLAKESLEE.—He has given his testimony in full and I want this to illustrate his testimony. A witness can always state that a certain paper shows the substance of his recollection, after he has stated his recollection.

The MASTER.—From a paper that he knew where it came from.

(Deposition of Frank Jackson.)

Mr. BLAKESLEE.—He testified that it came from the man to whom the original drawing went.

The MASTER.—But how it came there he does not know.

Mr. BLAKESLEE.—He testified that it was sent in 1902 from San Francisco.

The MASTER.—Not that paper.

Mr. BLAKESLEE.—The drawing was sent by Byron Jackson [412] Machine Works to Meade.

The MASTER.—There isn't any testimony to that effect.

Mr. LYON.—He has not said that it was sent to those people or anything of the kind.

Mr. MONTGOMERY.—He said that the Pabst pump drawings were sent to Meade. And now, this is not a copy of the Pabst pump drawing, so of course, your Honor is right, and we cannot introduce it; but all we want now is that when we get those drawings we can recall this witness and have him identify them.

The MASTER.—But you are jumping one step further here, and the objection to that will have to be sustained.

Mr. BLAKESLEE.—Let the record show—do you know whether or not this blue-print is the correct showing or copy or print of the drawing which was sent to Meade in 1902, for the first Pabst installation? A. No; this is not.

Q. You know that it is not? A. Yes.

Mr. BLAKESLEE.—Then we will not press that matter but reserve our right to recall him to identify the original drawing.

(Deposition of Frank Jackson.)

Cross-examination.

(By Mr. LYON.)

Q. Is this blue-print that you have just been referring to a duplicate of the blue-print attached to the affidavit in this case?

Mr. BLAKESLEE.—We object to that because it has been ruled out.

The MASTER.—He is not asking about the contents of it.

A. Yes, sir.

Q. (By Mr. LYON.) Where was the Byron Jackson Machine Works Office in 1902 located?

A. San Francisco. [413]

Q. What part of San Francisco?

A. Sixth and Bluxome Street.

Q. And you are very sure that this first pump with the tube or casing around the line shaft or drive shaft was assembled in the latter part of 1899 or fore part of 1900? A. No; in 1900.

Q. What time of the year 1900 was it first assembled?

A. I should imagine that it was, as near as I could guess, somewhere about the middle of the year.

Q. What was your position with the company at that time?

A. Foreman, and afterwards superintendent.

Q. Who else, do you remember, was connected with the company's shop at that time?

A. Mr. Byron Jackson—you mean employees or what?

Q. Yes, or the principal man of the shop.



(Deposition of Frank Jackson.)

A. Mr. Vandergrift was draughtsman; Mr. Howard Thomas was assistant draughtsman and Mr. H. C. Robb was working in the shop, and I can name several of the machinists who were working in the shop. Mr. James Bailey was working in the shop.

Q. What time of the year was it that that experimental or model device was first erected?

A. That was in the early part of 1901 or else right about the end of 1899.

Q. You mean 1900? A. Yes, sir.

Q. Which was it, 1901, 1900 or 1899?

A. 1899 or first part of 1900.

Q. When you say the fore part, you mean January or February?

A. I suppose January, February or possibly March. We were very busy and those things moved slowly and sometimes too [414] quite a little time.

Q. Is there any means whatever by which you can fix that date?

A. Well, I can fix it reasonably certain by my own pump which I was testing at that time, a pump that I patented.

Q. You mean solely by association with the fact that you had a balanced pump of yours and were working with that at the time? A. Yes, sir.

Q. Now, which of those devices were gotten out first, your balanced pump or this first experimental pump with the enclosed line shaft?

A. They were practically about the same time.

Q. You say practically about the same time.

(Deposition of Frank Jackson.)

Were they absolutely coincident as to time?

A. Oh, there might have been two or three weeks or possibly a month between them. I cannot recall exactly, but it was about that time.

Q. When was it that you first commenced work on your balanced pump?

A. I commenced that in 1899.

Q. What time in 1899?

A. Somewhere along about September or somewhere along there.

Q. What did you first do with it in September, 1899?

A. I first began to—well, I made the sketch which I have in my possession, witnessed by Mr. Vandergrift and Byron Jackson.

Q. At that time was work started on the enclosed line shaft model or experimental device?

A. A little later. [415]

Q. How much later?

A. Well, about in the early part of 1900. I followed right up after that, because we saw that we had something.

Q. When was it that you first sent one of those devices to the Pabst Company at Milwaukee?

A. That was, I think, 1903—in the early part of 1903.

Q. You say “the early part of 1903.” Was it January, February, March, April or May?

A. I cannot recall that now.

Q. You are sure it was in 1903? A. Yes, sir.

Q. Positive it was not in the year 1902?

A. No; I don't think they were shipped in 1902.

(Deposition of Frank Jackson.)

Q. Are you sure it was either 1902 or '03?

Mr. BLAKESLEE.—I object to that. The witness has answered twice that he is sure and positive.

A. Yes.

Q. (By Mr. LYON.) Sure that the drawings made for Meade were not first made in 1904?

A. No, sir; it was made in 1902.

Q. What time in 1902 was it that Mr. H. C. Robb went to Milwaukee on this Pabst matter?

A. I think about the middle of the year; I am not sure.

Q. When you say "middle of the year" do you mean June or July, 1903?

A. Somewhere along there; I am not absolutely certain.

Q. What is your best recollection?

A. I would say about the middle of the year, June or July, somewhere.

Q. Was it in June?

A. I cannot say. [416]

Q. Or was it in July?

A. I cannot say.

Q. Was it in August, 1903?

A. I couldn't say.

Q. Would you say that it went there at any time in 1903? A. Yes, sir.

Q. You are certain it was not 1904?

A. I think so; I am not positive about that. That is not quite clear in my mind.

Q. I want you to think, now, and tell us whether it was 1902, '03, or '04 when Mr. H. C. Robb went

(Deposition of Frank Jackson.)

to Milwaukee? A. It was in 1903.

Q. You are positive of that, are you?

A. Yes, sir.

Q. And you cannot tell us whether that was in May, June, July or August, 1903, when Mr. Robb went to Milwaukee?

A. No; I cannot recall that now.

Q. Can you say it was in one of those four months?

A. Well, I would say it was probably in July or August or September; I am not positive about those dates.

Q. You stated, I believe, that about two months ago you saw some original drawings here in Los Angeles. In whose possession were they then?

A. In the possession of Mr. Keating.

Q. He is the president of the company—the Byron Jackson Company?

A. President of the Byron Jackson Iron Works.

Q. Was he accompanied at that time by his counsel, John H. Miller? A. No, sir.

Q. Where was it you were shown those drawings?

A. In the Hotel Hayward. [417]

Q. Here in Los Angeles? A. Yes, sir.

Q. What was the occasion of your seeing them at that time?

A. He was talking about the pumps and informed me that action had been taken, and I understood it was by suit or otherwise, but I cannot understand about that, and he talked to me about them.

Q. And you talked over with him the dates and

(Deposition of Frank Jackson.)

what was done in the early days in regard to these devices?

A. Not very much about the dates. I just simply looked at the drawings and said, "I think I recognize those drawings all right."

Q. How many drawings did he have?

A. He had two, and I don't know but what he had three.

Q. Tracings or blue-prints?

A. Blue-prints.

Q. What size prints?

A. Oh, I should say about two feet by thirty inches or something like that.

Q. Were either of them substantially duplicates of the tracing which you have in pocket and which you have produced here today?

A. No, sir; none of them.

Q. Not like them?

A. They were like it, but not this exact drawing. They were on this exact principle and showed the construction just like what I have here.

Q. But a different print?

A. Yes, sir; different prints, but the same construction, identically.

Q. Did it have the same dates on that that one has? [418] A. No, sir.

Q. Do you remember the dates upon any one of those three blue-prints or drawings which Mr. Keating showed you at that time?

A. Yes, sir; there was one of them that he showed me, the drawing that was submitted to D. W. Meade, was dated March, 1902.

(Deposition of Frank Jackson.)

Q. What did the drawing show?

A. That drawing showed the pump and a part of the discharge pipe, the inner tube and the shaft.

Q. Is that all?

A. That is all it showed. It did not show the entire construction all the way up, but that part of it.

(The witness' answer to the next to the last question is read.)

Q. You mean by the inner tube and the shaft as shown by that drawing that you have just referred to?

A. It was for the protection of the shaft and the oil similar to that which I have been describing.

Q. That drawing is dated 1902?      A. Yes, sir.

Q. What date?

A. March, I am pretty sure.

Q. Made by whom?

A. Made by Mr. Vandergrift.

Q. How large a drawing was it?

A. A drawing about two feet, I should judge, by thirty inches, or something like that. I don't remember the exact size of it.

Q. What was the other drawing or blue-print?

A. About the same size.

Q. What did it contain?

A. I didn't pay so much attention to that, but that drawing was 1902, I am pretty sure. [419]

Q. What was it a drawing of?

A. A drawing of the entire construction, showing the general construction of the pump, made for the purpose of showing the erecting engineer how to

(Deposition of Frank Jackson.)

make the lengths of his tube and discharge pipes.

Q. Describe that in detail as your memory allows you, as far as you can go.

A. My former description will answer that description as near as I could answer it.

Mr. LYON.—We move to strike out the answer from the record and exclude it from consideration as not responsive.

A. I will answer anything you ask.

The MASTER.—The question is, to describe that particular drawing. Don't describe any other but that particular one.

A. That particular one for the Pabst people?

The MASTER.—I don't know whether it is the Pabst people, or not.

Q. (By Mr. LYON.) I am asking you about the second one which you have referred to. You said one that was made in 1902, and the one that was the second one, the one that you say that you did not particularly notice the date on.

Mr. BLAKESLEE.—You mean the second seen at the Hayward Hotel?

Mr. LYON.—Yes.

A. That consisted of a pump of six stages. I did not count the stages carefully. And it showed the exterior or discharge pipe, the shaft extending from the pump to the driving mechanism at the top. It also showed the tube surrounding the shaft and it showed the intermediate bearings of which there were two to each section, the sections being made in about twenty foot lengths, with a spider at each of the twenty-foot lengths. This [420]

(Deposition of Frank Jackson.)

intermediate bearing which was formed as a sleeve with a thread externally, and a tube threaded internally screwed into it, the bearing babbitted and the shaft extending through that clear to the surface. At each end of the shaft it was threaded with a left-hand thread, and then the tube extended clear through, with the discharge elbow at the top of the pump. The tube was surrounded at the top with a stuffing-box and was open at the top and extending through the tube. The shaft extended up to the top frame which carried the pulley and also carried ball-bearings to support the rotating parts, as they didn't have any ball-bearing in the columns.

Q. Are you describing that drawing or are you remembering something else?

A. I am remembering that.

Q. Did that or did it *now* show ball-bearings?

A. That drawing does not show ball-bearings.

Q. Please proceed and answer the question, what that particular drawing showed.

A. Then the tube was open and showed the shaft extending through the tube up through the pulley and up through the upper bearings. There was the discharge all at the top and the bottom of the pump did not show any such part, but it ended right there, so far as the drawing was concerned. These bearings were made out of cast iron, cast larger than the shaft, and the bearings, each one of them, babbitted.

Q. Were they so indicated on that drawing?

A. I think you will find that it is.



(Deposition of Frank Jackson.)

Q. I am asking from your memory whether it was or not? A. Yes, sir; it was.

Q. Proceed.

A. We extended a small brass tube— [421]

Q. I did not ask you what you did, but ask you what this drawing showed. Confine your answer entirely to what this drawing showed.

A. That drawing shows that.

Q. Is that all you recollect about that particular drawing? A. Yes, sir.

Q. Was there more than one figure of that drawing, or view? A. One view only.

Q. Just one assembled view?

A. Yes, sir; one assembled view is all I recall.

Q. The pump proper shown in section or in full?

A. Shown in an outline drawing and not in sections.

Q. What portions of the drawings were shown in sections?

A. From the top of the pump to the surface.

Q. Only one assembled view to that drawing?

A. That is all I recollect.

Q. What was the third drawing that you say you saw at the Hayward Hotel in the possession of Mr. Keating about two months ago?

A. If my recollection is right, it was a pump drawing very similar to the one I have just described, as far as general construction is concerned.

Q. (By Mr. BLAKESLEE.) Like the first one?

The MASTER.—Like the one he has just described.

(Deposition of Frank Jackson.)

Q. By Mr. BLAKESLEE.) Like the second?

A. Yes, sir; I didn't pay any particular attention to that drawing. I looked only at the first two particularly.

Q. (By Mr. LYON.) Did you notice what this third drawing purported to be? [422]

A. No, sir; I only glanced at it, and saw that it was a pump similar—

Q. Was it a drawing that you had ever seen before? A. Yes, sir.

Q. When had you seen it before?

A. I saw it in the drawing-room of—

Q. When?

A. I had seen it somewhere between 1903 and 1904.

Q. When did you first see it?

A. Somewhere about that time.

Q. Was it 1903 or '04?

A. I couldn't tell you.

Q. Was it also a drawing of this alleged Pabst installation?

A. No, sir; that was a separate pump. I think it was a smaller diameter pump. That is, a smaller size pump.

Q. Did that drawing consist of more than one view or was it just one assembled view of the pump?

A. I think that was just an assembled view of the pump.

Q. Now, referring to the first one of the 1903 drawings, was there more than one figure of that drawing? A. Just one.

(Deposition of Frank Jackson.)

Q. No other views than one assembled view?

A. To the best of my recollection there was one assembled view.

Q. And that was made, according to your recollection, by Vandergrift? A. Yes, sir.

Q. And in the year 1902? A. Yes, sir. [423]

Q. As a matter of fact, did you have, and when I say "you" I mean the Byron Jackson Company, ship to the Pabst Brewing Company any enclosed line shaft pumps at all, or did you simply ship the pumps and leave the question of the line shaft to be taken care of in the east?

Mr. BLAKESLEE.—Objected to as argumentative.

The MASTER.—It is cross-examination.

Mr. BLAKESLEE.—And, furthermore, as not complete. "Taken care of" might mean a lot of things. What the question means I don't know.

The MASTER.—The witness understands the question. (The question is read.)

The MASTER.—Answer the question.

A. Yes, sir; we did not ship the two, the shafting or the outside casing, known as the discharge pipe. We shipped the pump complete with the bearings and the spiders, the couplings and the pump works of the pump.

Q. (By Mr. LYON.) Let me see if we understand you correctly, Mr. Jackson. You say that in connection with the first Pabst order drawings were made by Vandergrift and Thomas? A. Yes, sir.

Q. Those first drawings, according to your recollection, were made in 1902? A. Yes, sir.

(Deposition of Frank Jackson.)

Q. Now, you say also, that drawings were made and sent to D. W. Meade, the consulting engineer for his approval?

A. Those were the drawings I referred to.

Q. Those were the same drawings? A. Yes, sir.

Q. Were those drawings as so sent to him then, drawings of the structure as it was made to be sent to the Pabst Brewing [424] Company on the first order, or were they changed?

A. Very little, if any change.

Q. Was there any change in them?

A. The only change was the bend of the shaft tube. It was made a little large in diameter in the first drawing, and that was made smaller in the second drawing, showing the details.

Q. That is the only change?

A. That is the only change that I recollect.

Q. Were there any drawings made in 1904 for this Pabst installation? A. No; I think not.

Q. None whatever? A. I think not.

Q. Were there any made in 1904 for the enclosed line shaft pumps as you were making them or going to make them in the Byron Jackson Company?

A. I think not.

Q. According to your recollection, no such drawings were made in 1904? A. I don't recall any.

Q. If there were any then they have passed entirely from your memory? Is that it?

A. Yes, sir.

Q. (By the MASTER.) Where is Mr. Meade?

A. In the east, in Madison, Wisconsin. I under-

(Deposition of Frank Jackson.)

stand he is a professor in the University.

Q. Does he still live in that country?

A. Yes, sir.

Q. Did Byron Jackson have any books and accounts? A. We lost everything but the ledger.

Q. In the fire? [425] A. Yes, sir.

Q. None of them were saved?

A. No; the only record they have of sales would be the sales booked in Los Angeles. The sales books up there with the exception of the ledger were lost in the fire.

Q. And you took some of these plans and buried them at the time of the fire? A. Yes, sir.

Q. And they were not destroyed?

A. Those were not destroyed.

Q. Were the books also preserved?

A. No; just the ledger. The head bookkeeper went in the morning of the fire and got the safe open and took the ledger—that was all they tried to take, because the building commenced to totter and were later wrecked.

Q. When he got that ledger what became of it?

A. He took it in his possession and took it home till we got an office.

Q. Where is it now?

A. In the possession of the Byron Jackson Iron Works.

Q. The original book?

A. Yes, sir; the original ledger.

Mr. BLAKESLEE.—We will doubtless produce it in San Francisco.

Q. Do you remember the date upon which you

(Deposition of Frank Jackson.)

made application for the patent on this balanced pump, as you call it, or as it is entitled in the patent "End Thrust Counter Balance for Centrifugal Pumps and Shafting" was made?

Mr. MONTGOMERY.—That is not proper cross-examination and immaterial.

Mr. BLAKESLEE.—And not calling for the best evidence. [426]

The MASTER.—It is testing the memory of the witness and he asks at the time the first drawings were made was it at the same time that they made the drawings on the other pump.

Mr. MONTGOMERY.—He didn't say anything about the patent application.

Mr. LYON.—I will connect the matter in a moment.

The MASTER.—The objection is overruled.

Mr. BLAKESLEE.—Exception.

(The question is read.)

A. My first sketch on which I based the patent was May three, and witnessed May 3, 1899, and in September, I made the application.

Mr. LYON.—We move to strike the answer from the record and exclude it from consideration on the ground that it is not responsive to the question, and we ask that the records show that before answering this question the witness drew from his pocket a piece of yellow paper and evidently had used the same before giving his answer.

The MASTER.—The first part of it will be granted. It is not responsive. Read the question again.

(Deposition of Frank Jackson.)

(The question is read by the reporter.)

The MASTER.—When was the application itself made?

A. Byron Jackson and his attorneys made the application. I could not tell you within a month of when they made the application or two months, but the patent, I think you will find if you get hold of the record, shows September.

Q. You signed the application, didn't you?

A. No, sir; it was signed by the patent attorneys as is usual in such cases.

Q. You didn't sign the petition for the patent in that matter? [427]

A. Oh, yes; I think I signed the petition.

Q. And the power of attorney and specifications and the oath? A. Yes, sir.

Q. Do you remember when it was that that took place?

A. Oh, August or September. I could not tell you the date exactly.

Q. How long was it after you conceived that invention before you made the application for the patent?

Mr. BLAKESLEE.—We object to that as not proper cross-examination. It is inquiring into a matter which is not proper to inquire into.

The MASTER.—He has taken that as the time when he knew that this other was coming.

Mr. BLAKESLEE.— He says he was working on it. It is nothing that can be disproved. It cannot be met, because it is a mental operation and not disclosure of somebody else.

The MASTER.—The witness has said that this

(Deposition of Frank Jackson.)

particular invention in question was conceived about the same time. Therefore, it being used as a comparison by counsel in cross-examination, he is right to go into it.

Mr. BLAKESLEE.—My recollection is that he testified about the time he was working at his invention, that Byron Jackson conceived the idea of this invention of his.

The MASTER.—Yes, but I do think he used that comparison and counsel had the right to inquire into all the times and circumstances of the act.

Mr. BLAKESLEE.—My objection is as to the act of conception. And, furthermore, it might be for the purpose of adducing evidence usable in some other matter. There might be some controversy in which that matter would be germane. [428]

The MASTER.—If he had not brought it in in the first place in trying to fix the date with and make a comparison, it would be a different thing.

Mr. BLAKESLEE.—My objection goes as to the conception factor.

The MASTER.—Yes, but I think it is all parts of the same thing.

Mr. BLAKESLEE.—I wish to note an exception to the ruling.

A. The application was made in September.

Q. (By Mr. LYON.) What year?

A. 1899.

Q. (By the MASTER.) And how long before that did you conceive the idea before the application was made? A. In May.

Q. (By Mr. LYON.) 1899? A. May, 1899.



(Deposition of Frank Jackson.)

Q. And before making the application for that patent, had you built a pump embodying that invention, Mr. Jackson?

A. This invention, before making the application? (The question is read by the reporter.)

A. Yes, sir.

Q. (By Mr. LYON.) Did you not in an affidavit made by you, entitled, "In the United States District Court for the Northern district of California, Second Division, in a suit wherein Byron Jackson Iron Works is plaintiff, and the Pelton Water Works was defendant, in Equity, make a certain affidavit on the 22d day of June, 1918, before L. Belle Weaver, Notary Public in and for the County of Los Angeles, State of California," referring to this end thrust counter balanced for centrifugal pumps and shaft, set forth in Patent No. 666,869, granted to you on January 29, 1901, for the invention you have been referring, state, "I first [429] conceived the invention described and set forth and claimed in letters patent No. 666,869, less than two or three weeks before the date of placing the invention in the hands of the attorneys who filed the patent application. I conceived this invention, explained to Byron Jackson and took a regular Byron Jackson pump which was in stock, and attached my new balance and tested it out in the Byron Jackson shop. This pump was a complete success, and we immediately applied for the patent success, and we immediately applied for the patent covering the balance. As I remember it, this was either a five or six-inch pump. After that date we commenced to manufacture the pump with my new

(Deposition of Frank Jackson.)

balance," and I show you a copy of that affidavit.

A. I don't recall this affidavit and this is not my signature.

Mr. LYON.—We move to strike the answer from the record and exclude it from consideration on the ground that it is not responsive. The question is not, "Is that the affidavit?" The question is, "Did you make the statement contained in the top paragraph which I have quoted and which the reporter will now again read to you?"

(The reporter reads the question.)  
question.)

The MASTER.—The question is did you make that statement in the affidavit referred to, and he says, "I don't recollect the affidavit."

A. I don't recall this affidavit.

(The question is read by the reporter.)

The MASTER.—The question is did you make that affidavit or not?

A. I made that affidavit. But, on the other hand, the application passed out of my hands and was in the attorney's hands for some time.

Q. (By Mr. LYON.) You had forgotten all about this [430] affidavit until I showed it to you, had you not, Mr. Jackson? A. Sir?

(Question is read.)

A. Yes, sir.

Q. And you forgotten the statement you made in that affidavit that it was less than two or three weeks prior to placing the application in the hands of the attorneys, that you had conceived the invention?

A. That is, placing it in the hands of the attorneys;

(Deposition of Frank Jackson.)

yes, sir. But it was some time after that before I went to Dewey Strong's office.

Q. When did you place it in the hands of the attorneys?

A. I didn't place it in the hands of the attorneys. Mr. Byron Jackson did that.

Q. When did he place it in the hands of the attorneys?

A. I couldn't tell you exactly. I turned it over to Mr. Byron Jackson and I think that affidavit would be pretty true and I think you will find Mr. Byron Jackson will testify the same thing.

Q. What do you mean in this affidavit by "that it was less than two or three weeks before the date of placing the invention in the hands of the attorneys who filed the patent application, that you first conceived that invention?"

Mr. BLAKESLEE.—We object to that. The statement speaks for itself.

The MASTER.—If you want to contradict the witness, show him the original affidavit.

Mr. LYON.—He has already stated that he remembers making the statement, now. He don't deny making the statement, but he attempts now to state some difference between the statement of that affidavit and a statement that the invention was only [431] conceived a very short time before the application was filed, and I want any explanation he can give of that.

Mr. BLAKESLEE.—That is not his testimony.

Q. (Mr. LYON.) Is it your recollection that you went to the attorney's office or that the placing of the

(Deposition of Frank Jackson.)

invention in the hands of the attorneys and filing the patent application was many months before the application was actually filed in the Patent Office?

A. No; I think not.

Q. Now, then, what kind of pumps at that time, to wit, the time of the filing of this application that you have been referring to, was the Byron Jackson Company making? Tell us in full each of them.

A. They were making what is known as the vertical pit pump, a pump that was set in the bottom of a pit and operated by a shaft extending to the top of the pit and run with a pulley with a quarter turn belt. The water was taken in through a suction pipe to the side of the pump and carried over the top of the pump and taken down into the top of the runner and discharged out of a volute shell by an elbow which turned the direction of the water up through a discharge pipe to the surface of the ground, or, generally, to the surface of the ground.

Q. Could such a pump as that be placed in a small bored well?

Mr. MONTGOMERY.—Objected to as not proper cross-examination.

The MASTER.—Why not? From his memory he can show that his memory is defective, and anything that describes the pump or its use will show that because it may be shown that those particular pumps were not used for three or four years. [432]

A. It depends upon how small a well you refer to. Some wells two feet in diameter are called small, and some five feet in diameter are called small.

(Deposition of Frank Jackson.)

Q. (By Mr. LYON.) Could such a pump be used in the two-foot well?

A. Yes, sir.

Q. In a ten-inch well? A. No, sir.

Q. A sixteen-inch diameter well? A. No, sir.

Q. What other kinds of pumps at that time was Byron Jackson making?

Q. (By the MASTER.) Do you call that by any specific name? I mean the patent device?

A. Yes, sir; it was a patent device. Mr. Byron Jackson held a patent on a pump that was issued before. It was called the Byron Jackson pump. They were also constructing horizontal pumps, the shafts being horizontal and operating with belts and some times connected with electric motors.

Mr. BLAKESLEE.—This question before, was vertical pit pumps.

Mr. LYON.—All pumps.

Mr. BLAKESLEE.—I mean the one for the sixteen-inch well.

The MASTER.—It was confined to all pumps.

Q. (By Mr. LYON.) This horizontal pump was that adapted for use in a relatively small, say sixteen-inch bored well? A. No, sir.

Q. Now, what other types of pumps were they making at that time?

A. They were making what was known as slime pumps, which were used in connection with mining operations.

Q. Any other centrifugal pumps or runners?  
[433]

(Deposition of Frank Jackson.)

A. Those were centrifugal pumps and dredging pumps.

Q. Those were not capable of use in the small bored well? A. No, sir.

Q. Was any other pump that could have been used in the small bored well?

A. Outside of the pumps that I have been describing that were made at that time.

Q. No others? A. No, sir.

Q. When did you next make another type of centrifugal pump that could be used in a small well—in a small diameter bored well?

Mr. BLAKESLEE.—Objected to as indefinite; Next after when?

Q. (By Mr. LYON.) After the ones we have been talking about.

Mr. BLAKESLEE.—After the ones that he said would not have been used in small bored wells?

The MASTER.—After the pumps they were making at this particular time.

Mr. LYON.—In 1899, and the time of this invention that he has referred to.

Mr. BLAKESLEE.—You mean his centrifugal balanced invention?

A. What pump are you referring to now?

The MASTER.—Your pump that you invented yourself.

A. Did I make any further changes in it?

The MASTER.—No; what other pumps was Byron Jackson handling at that time?

A. He was manufacturing in 1901 and 1902 this bored well pump, that we have been talking about.

(Deposition of Frank Jackson.)

The MASTER.—What else?

A. Then we made some plunger pumps and also made some of [434] what was called rotary pumps. They are differentiated from the centrifugal pumps, because they are a positive acting pump, by gears running together.

Q. (By Mr. LYON.) Let me ask you this question: Definitely when was it that you made at the Byron Jackson Works, the first what you call bore well pump—the first pump that went to the Pabst Brewing Company? A. 1903.

Q. How did the pump part of that pump differ from the previous centrifugal pump manufactured by the Byron Jackson Company?

A. It was differentiated in this way: That the previous pump manufactured by the Byron Jackson Company known as the pit pump, used a volute shell, the vertical shaft exterior to the discharge pipe, and the bored well pump is what is now known as the bowl pump or with the shells placed immediately one above the other, and the shaft that operated it extending through an enclosed tube inside of the discharge pipe, which varied according to the size of the pump.

Q. Let us see if we can get this matter a little clearer. I now show you, not for the particular purpose of any of the lettering on that drawing, but a drawing there. See if that generally illustrates the manner of the assembling of the pit pump that you have been referring to as manufactured by the Byron Jackson Company in about 1899 or 1900?

A. Yes; I think that is the general idea of it.

Q. And this pipe which is marked in the drawing

(Deposition of Frank Jackson.)

"discharge" would be the discharge pipe, illustrating in a general way what you have been referring to?

A. Yes, sir; a pit pump.

Q. And that is the type of pump the Byron Jackson Company [435] was manufacturing at the time you refer to, 1899, when you got up that invention of yours?

A. Yes, sir; prior to that.

Mr. LYON.—I will ask that the reporter have a photostatic copy made of the drawing, and that it be offered in evidence as Plaintiff's Exhibit "M," and also that a photostat copy be furnished to each side.

The MASTER.—That will show the printing.

Mr. LYON.—But we are only offering the drawing itself and the letters and the reference characters that I referred to.

Mr. BLAKESLEE.—We wish it to be shown on the record that the witness had no opportunity to examine it as to anything but its general appearance and that all he could gather would be a quick first impression, and we object to the procedure as not cross-examination, if the testimony is attempted to be based on the first impression of the witness and going to any written matter on this drawing.

Mr. LYON.—If there is any question of the witness being careless in his testimony, we will ask the witness again to look at the cut and ask him if he wishes to change his testimony.

Mr. BLAKESLEE.—We ask that the witness have an opportunity to study it.



(Deposition of Frank Jackson.)

Mr. LYON.—Let him take all the time he wants on it.

A. This would be practically the method of installation of a Byron Jackson pit pump, with the exception that this pump is not like the Byron Jackson pump.

Q. (By Mr. LYON.) In what respect is that pump as illustrated in that sketch not like it?

A. In that this pump apparently takes the suction from the bottom of the pump, while the Byron Jackson pump takes the water in at the top of the pump. [436]

Q. In other words, the pump is itself if it were a Byron Jackson pump, would have to be submerged?

A. No; Byron Jackson carried an air hole from the top of the old pump, and down into the well.

Q. And the outside pipe, is that correctly illustrated?

A. Yes, sir; that illustrates it practically.

Mr. MONTGOMERY.—I see to this if you block out this printed matter.

Mr. LYON.—I am not offering the printed matter. Upperwise the general manner of mounting the pipe is correctly illustrated?

A. Oh, yes; similar to that. Most of them do.

Q. Now, Mr. Jackson, 1902 was the Byron Jackson Company manufacturing a centrifugal pump with a center top discharge?

A. Well, we manufactured the sample pump I referred to, and were also proceeding with the manufacture of other pumps at that time.

Q. Proceeding with the manufacture of how many

(Deposition of Frank Jackson.)

other pumps of that type?

A. It is difficult for me to tell.

Q. What is your recollection?

A. Well, I should imagine that there were perhaps—I couldn't tell you—perhaps a half dozen of those pumps went through at that time.

Q. Wherein, mechanically, did they differ from the type which you have just referred to, in which the elbow came over and down and the discharge pipe was at the side?

A. They differed in this; as I have explained several times, they were superimposed, one shell above the other, taking the water at the bottom and discharging at the top, and discharging through the discharge pipe, and having an inner tube [437] and a shaft projecting through the inner tube.

Q. With such a construction as you used with the centrifugal pumps as manufactured by the Byron Jackson Company in 1899 or 1900, and having the elbow inlet on the side or eccentric discharge, this enclosed line shaft feature of lubrication, for alignment of the protecting casing, and driving shaft inside the discharge pipe, and the protecting thereby of the bearings from sand and water, could not be utilized, could they?

Mr. BLAKESLEE.—We object to that as not calling for a statement of facts, but merely argumentative and not calling for a statement of what was done, but purely speculative and a matter for argument by counsel from the evidence he may get from this witness.

Mr. LYON.—I am asking if such a type of pump

(Deposition of Frank Jackson.)

could be used for that purpose?

Mr. BLAKESLEE.—That is not cross-examination.

Mr. LYON.—The question is withdrawn.

Q. How long was it after you and Mr. Byron Jackson had talked over this enclosed line shaft feature that you say, that Mr. Byron Jackson ordered drawings made for the larger size pump?

A. I can't say just exactly how long.

Q. What is your recollection?

A. My recollection is that it might be a month or so, because we were very busy and doing a great deal of other work besides that and the drawing-room was very busy.

Q. What year was it in?

A. In 1901, to the best of my recollection.

Q. Not 1900?

A. 1900 and 1901, I can't tell you which. Probably 1900, I would say. Yes, I think it was 1900. It is hard to remember those dates just to a minute. [438]

Q. To what circumstances do you tie that to when you fix that date as 1900, or is it a mere deduction?

A. I simply arrive at that from association with other things.

Q. Have you any written memorandum or document or anything of that kind, made at that time, to which you can fix that date?

A. No; all my memorandums and things of that kind, together with my text-books and everything, were destroyed in the fire.

(Deposition of Frank Jackson.)

Q. Does that first drawing show a three-stage centrifugal pump?

A. I think it shows a three-stage and possibly a four. I won't be certain about that. It is too far back.

Q. Do you remember approximately what time of the year that drawing was made?

A. No; I couldn't say the date.

Q. What was done with the drawing after it was made?

A. They were filed in the drawing-room.

Q. Was there anything ever done with the construction of that drawing toward making one of the devices? A. Yes, sir.

Q. When? A. Patterns were made.

Q. When?

A. 1901. In the latter part of 1901, or, let me say, very early in 1902. But that drawing, I think, was made, and the initial pump was tested out somewhere in the latter part of 1900 or early in 1901.

Q. Now, as assembled in such tests, describe that to us. [439]

A. Do you mean the detail of the construction of the pump all the way through as I have already described it?

Q. I want to know what it was. Tell me what it was that was put up at that time that you are speaking of.

A. It was a pump, as I have already described it several times, with bowls, one placed above the other, with impellers in the bowls and a shaft passing through the impellers, all of them on the same

(Deposition of Frank Jackson.)

shaft and the shaft extending up to the second floor of the building and a tube surrounding the shaft, and the discharge pipe made in two sections, and at the joining of the two sections a spider consisting of the sleeve with three lugs extending from the sleeve, the ends of the spider tapped out and screws put in which were to be backed out and were backed out, to center the tube and the bearings in the center of the discharge pipe, and an intermediate bearing consisted of a sleeve exteriorly threaded and the tube extending from the upper bearing in the pump threaded internally and screwed on to these sleeves, and the spider was identical with these intermediate bearings, with the exception of the extending lugs. The tube extended up through the discharge elbow, and surrounded by a stuffing-box, the shaft extending up through and carried on a pulley frame. The discharge oil discharging into a weir or a square box with a weir in it and the pipe returned to the tank on the lower floor. The pump was partially submerged in the tank, so that it required no priming in order to start the pump. It was also provided with an oil pipe extending to the open end of this tube, and an oil cup was set on the side of the frame,—a drip or cup.

Q. I believe you said that there was an A frame. What do you mean by that?

A. We called it an A frame because it is the ordinary [440] construction of the frame. It is formed something like the letter A with bearings in between.

Q. How long was the shaft of this pump?

(Deposition of Frank Jackson.)

A. About fifteen feet, or something like that.

Q. How many sections? A. Two.

Q. What was the diameter of that shaft?

A. I don't recall now. It might have been an inch and a half or possibly two inches.

Q. Was this drawing that you speak of a working drawing to scale? A. Oh, undoubtedly.

Q. There is no question in your mind that your memory is correct in that regard?

A. As to the drawing?

Q. As to being to scale.

A. I think it was to scale. I would not be absolutely sure about that. Sometimes we made trial things and experimental things with free-hand sketches.

Q. Was this an experimental thing, this pump that you are speaking of?

Mr. BLAKESLEE.—Let him state what was done with it and then it will be a legal conclusion.

The MASTER.—It is cross-examination and he may ask him whether it was an experimental pump or not.

Mr. BLAKESLEE.—We think not, within the rulings of the cases. But that is a pure conclusion. An experiment has a well-defined status in patent law, but it is a legal status determined upon the physical conditions testified to by the witness.

The MASTER.—I think the witness can testify as a fact whether the pump that was erected was put up as an experiment [441] or whether it was a finality.

Mr. BLAKESLEE.—My argument is that that

(Deposition of Frank Jackson.)

cannot be done. He must testify what was done with it and it is then to be determined legally whether it was experimental or actually experimentally or actually used.

The MASTER.—Have you any authorities on that?

Mr. BLAKESLEE.—Yes, sir.

The MASTER.—We will suspend then until tomorrow morning. Thereupon an adjournment was had, with the understanding that the Master would proceed to San Francisco on Wednesday evening, and resume the hearing in San Francisco upon arrival there. [442]

Los Angeles, Cal., January 16, 1920.

2:00 o'clock P. M.

Pursuant to the adjournment, court reassembled.  
Present: Hon. LYNN HELM, Special Master.

FREDERICK S. LYON, Solicitor for  
Complainant.

CHARLES C. MONTGOMERY and  
RAYMOND IVES BLAKESLEE,  
Solicitors for Defendant.

FRANK JACKSON, hereto sworn and partially examined, was recalled and his cross-examination resumed.

Mr. LYON.—Let the record show that the witness has produced blue-prints off of a tracing Defendant's Exhibit "C," No. 1-C-75, Defendant's Exhibit 3, No. 3-E-22, and 1-E-72, the last one being off of the tracing Defendant's Exhibit 5.

A. These are both Defendant's Exhibit 6.

(Deposition of Frank Jackson.)

Mr. LYON.—Such prints containing a reproduction of all the dates and printed matter on such tracings and—

Q. At what time did the pump with the enclosed line shaft which you have referred to as experimental, have the lubricating pipe exterior to the discharge pipe?

A. In 1901, or, perhaps, in 1902, but I think 1901.

Q. Now, describe how that lubricating pipe was so arranged exterior to the discharge pipe.

A. It extended down parallel with the discharge pipe to the top shell of the pump, and then was connected on drilled ports to the bearings of the pump—that is, the pump proper. It had nothing to do with lubricating the enclosed shaft. That was a separate pipe, fed from the reservoir at the top of the column and fastened to the pulley frame.

Q. At what time did that pump have such lubricating pipe extending inside of the discharge pipe?  
[443]

A. At the same time.

Q. And extending to the same bearings?

A. No; going to the top of the open tube. The top of the tube was open. That is, oil was dropped in from the same reservoir.

Q. There was no stuffing-box at the top of the pump?

A. There was no stuffing-box around the shaft proper, but around the stationary tube which forms the shaft protection.

Q. Just explain a little more in detail where there was a stuffing-box in that experimental pump.

A. There was a large opening through the top of



(Deposition of Frank Jackson.)

the elbow which formed a discharge. Through that large opening the tube extended. Exterior to that was a space large enough to receive packing and a gland, to force down on to that to make it water tight, the object being to make it water tight so that the discharge water would not run out to the edge of the tube.

Q. What was the object, so far as you know, of this drain which is shown upon this exhibit 5 and marked "1½-inch drain"?

A. The idea was that when the pump began to operate the water would be drained below that point in the well and that the water would drain out of the tube in either direction so that the tube would be practically clear as far as water is concerned and that the oil would follow on down.

Q. Drain out of this same drain?

A. Yes, sir.

Q. Was that, so far as you recollect, the construction embodied in the first pump for the Pabst Brewing Company?     A. Yes.

Q. That first pump for the Pabst Brewing Company, so far as you know, was never set up and fully assembled with the [444] drive shaft and so forth all in position, before the pump was shipped to Wisconsin, was it?     A. No, sir.

Q. You never saw it before it was assembled then, did you?     A. No, sir.

Q. The same is true with regard to what you recollect as to the Waterloo pump?     A. Yes.

Q. Do you remember any other pump of 1903, 1904 or 1902, which used this enclosed line shaft

(Deposition of Frank Jackson.)

feature which you saw fully assembled, other than this experimental pump you have referred to?

A. Yes; there were two shipped to Elgin, Illinois.

Q. Do you remember for whom they were made?

A. No, sir.

Q. Do you remember the size of the pump?

A. They were a smaller size. I think they went into 12-inch wells.

Q. You don't remember when those were built?

A. I think in 1905.

Q. Did you see those fully assembled?

A. No, sir.

Q. That was my original question. Have you ever seen any of these assembled with the enclosed line shaft, except as you say, this experimental pump?

A. No. Yes, I have seen them. I will correct that. Because in 1908—

Q. We don't care anything about 1908. I was limiting the question to 1902, 1903 or 1904.

A. No.

Mr. LYON.—In connection with the cross-examination of [445] this witness, we offer in evidence as part of such cross-examination the affidavit of this witness made in this case and dated December 17, 1919, verified before Charles G. Montgomery, Notary Public, in and for Los Angeles County, State of California, together with the exhibit blueprint thereto attached.

Q. Mr. Jackson, who was connected with the Byron Jackson Machine Works as the shop foreman at the time this first experimental pump that

(Deposition of Frank Jackson.)

you have referred to was made?

Mr. BLAKESLEE.—We object again to qualifying of this first pump with the word “experimental” as being a sweeping definition which is improper, and being an arbitrary interpretation of the testimony, and being unnecessary to be used. The word “experimental” need not be used to define that pump.

The MASTER.—The objection is overruled. The witness has called it that and understands what he is talking about.

Mr. LYON.—He said it was only used for making certain tests of the lift of water and used experimentally in that sense, but not as a complete device.

The MASTER.—The objection is overruled.

Mr. BLAKESLEE.—Exception.

(Question is read.)

A. I was superintendent of most of that myself.

Q. Shop foreman?

A. I acted both as foreman and superintendent.

Q. Do you remember any of the other men who had anything to do with the building of that pump or were connected in any important position with the company at that time?

A. It is pretty hard for me to remember names. Those that I remember, would be probably at a later date.

Q. That is exactly what I want to ascertain.

A. There was a Mr. Edward Lyman who was working for us at that time, but what became of him I don't know. I have [446] not seen him for eighteen or nineteen years.

(Deposition of Frank Jackson.)

Q. Do you remember anyone else?

A. Do you refer to them as machinists or draughtsmen?

Q. In any position you can remember.

A. Mr. Howard Thomas, in 1900, was a draughtsman or assistant draughtsman. Mr. Vandergrift was draughtsman and designer. Mr. Byron Jackson acted himself as consulting engineer and also helped in designing and figuring.

Q. Let us confine it to whom you recollect in 1900.

A. Those parties that I have already referred to.

Q. No one else?

A. I think H. C. Robb was working for us at that time, but I don't think he worked on that pump.

Q. 1901?

A. Mr. Thomas was there, and Mr. Vandergrift was still there, and I am pretty sure Edward Thompson was.

Q. How long did Mr. Vandergrift remain with the company?

A. I can't say. I think perhaps two years, but I cannot recall.

Q. You mean his total connection with the company was two years?

A. I would not be positive about that date. It might have been two years or more, or possibly less.

Q. Do you remember when he first started to work for the company?

(Deposition of Frank Jackson.)

A. I think he began in 1899 or perhaps a little later than that.

Q. In 1902 who do you remember was there at work, connected with the Byron Jackson Machine Works?

A. Mr. Vandergrift and Mr. Thomas were both there, and also Mr. Forward. [447]

Q. Anyone else you can remember?

A. Mr. Robb was working there at that time, and Edward Thompson was working there at that time.

Q. Anyone else?

A. Mr. Ralph Gibson was working there as a teamster. That is all I can recall.

Q. Do you know a man by the name of George W. Cuthbertson? A. Yes, sir.

Q. When was it that he was connected with the Byron Jackson Machine Works?

A. Possibly he was working along there about that time.

Q. What do you mean by "About that time"?

A. Along, perhaps, 1901, '02 or '03. I can't remember definitely. We changed foreman several times. He acted as foreman for a while.

Q. You mean as shop foreman? A. Yes, sir.

Q. When was it that Mr. George W. Cuthbertson acted as shop foreman for the Byron Jackson Machine Works?

A. I would put that somewhere about 1902. I don't know exactly.

Q. For how long?

A. He was not foreman very long. I think perhaps several months, I would say.

(Deposition of Frank Jackson.)

Q. Who succeeded him? What is your best recollection as to when Mr. Cuthbertson first went to work for the Byron Jackson Machine Works?

A. It was possibly in 1900 or 1901. I am not positive about that at all.

Q. Do you state positively that George W. Cuthbertson [448] was not shop foreman at the time this first experimental pump you referred to was built? Answer the question yes or no, and then make such explanation as you desire.

A. He might possibly have been in the shop and might have been foreman for some part of the Iron working departments.

Q. What is your best recollection? Was he or was he not present and foreman of some part of the shop at that time?

A. I could not settle that date. It is out of my mind.

Q. Do you know a man by the name of Palsmaier? A. Yes, sir.

Q. Was he connected with the Byron Jackson Machine Works in 1900?

A. I know Mr. Palsmaier, but I don't know whether he came in 1900 or '01 or '02.

Q. What is your best recollection?

A. I think Mr. Palsmaier came there in 1902. He came there as salesman.

Q. So far as your recollection is concerned, does it enable you to state whether or not Mr. Palsmaier had anything to do with this Pabst Brewing Company sale of pumps?

A. No; I know nothing about the selling of

(Deposition of Frank Jackson.)

pumps, because that was entirely out of my province.

Q. Or anything to do with the construction, or about the shop during that time?

A. No more than an engineer would come into the office.

Q. Mr. Palsmaier was one of the engineers?

A. He was a selling engineer.

Q. What time are you referring to?

A. I think it was about 1901 or '02, or somewhere along there.

Q. I wish you would tell me how the bearings in the shaft [449] —the driving shaft of the first Pabst Brewing Company pump was built? Was it a babbitted bearing? A. Yes, sir.

Q. Explain how and what you mean by babbitted bearings?

A. The bearing was made like a sleeve or cylinder cast in a larger diameter than the shaft.

Q. Babbitted?

A. Babbitted. This bearing was threaded on the outside to receive the tubes which were threaded on the inside. Also, at each section or coupling of the pipe there was a bearing like this, with the exception that there extended three lugs within about an inch of the outer casing, and these were tapped to receive screws. These screws were intended to be backed out to the center of the tube, and the bearing in the center of the discharge pipe.

Q. What was the purpose of babbitting those bearings?

A. So that they might be renewed if necessary, and, furthermore, it was common construction at

(Deposition of Frank Jackson.)

that time. We were using Babbitt as the best material that we could use.

Q. Were those babblings put inside of another bearing which had an inside machine finished surface?

A. Some were made that way and some were babbed into the casings, direct. I don't recollect whether these were that way or whether there was a machine finish.

Q. How did you manage to hold them in the—

A. They were held in by screws. If the surface was not rough, you would have to provide a mechanical device to hold it in place.

Q. Was this first pump for the Pabst Company, were they braced anyway?

A. I am not clear. [450]

Q. Are you sure you used a babbed bearing in that pump and line shaft or what was it?

A. It was the first babbed bearing that I made.

Mr. LYON.—You may take the witness.

Redirect Examination.

(By Mr. BLAKESLEE.)

Q. Now, again, when was it that you severed your connection with the Byron Jackson Machine Works? A. 1909.

Q. At that time were any of the employees of the Works whose names you have mentioned in your cross-examination, connected with the Byron Jackson Machine Works or Iron Works?

A. Mr. Palsmaier and Mr. Walter Forward. But Mr. Thomas was not connected with it at that time.



(Deposition of Frank Jackson.)

Q. Were any of the working men in the shop in the years 1900, '01, '02 and '03, still with the Byron Jackson Iron Works when you left there?

A. I do not recall and I would not know, for this reason: for over a year before I left there I know I was out on other work instead of construction work.

Q. In 1908, were any of the working men still there?

A. With the exception of Mr. Palsmaier, I cannot recall any other. I was entirely outside then. I was building dredgers.

Q. Was Cuthbertson there? A. No, sir.

Q. You have not heard of his whereabouts since?

A. No, sir.

Q. Do you know the whereabouts of any of the working men of the Byron Jackson Machine Works who were there in 1900, '01, '02 or '03?

A. Mr. Robb.

Q. Anyone else? [451] A. At present?

Q. Anybody else? A. No.

Q. Do you know whether or not the Byron Jackson Works kept a book of employees during the years 1900, '01, '02 and '03, giving their addresses and means of locating them?

Mr. LYON.—Objected to as leading and suggestive. The witness has not laid any foundation to qualify him.

Mr. BLAKESLEE.—He was superintendent and asked if he knew.

A. They undoubtedly kept books.

Q. (By the MASTER.) What did you know?

(Deposition of Frank Jackson.)

A. So far as I know it was destroyed in the fire. They kept a book called a payroll.

Mr. LYON.—We object to the last statement on the ground that it is hearsay and the conclusion of the witness and incompetent.

The MASTER.—The objection is sustained.

Q. (By Mr. MONTGOMERY.) When did you last see such payroll book?

A. I would not remember having seen the payroll book, for I had nothing to do with the payroll book.

Q. (By Mr. BLAKESLEE.) Was that payroll book kept at the plant and works of the Byron Jackson Machine Works?

Mr. LYON.—Objected to as immaterial. The witness has shown that he does not know anything about it in particular.

Mr. BLAKESLEE.—He says after the year 1903 he did not use it. How about 1903? What is your knowledge about that payroll book?

A. I would see it occasionally, or perhaps, once in awhile they came to me and inquired about somebody's wages. It was kept at the works. [452]

Q. Do you remember of any record book or papers of the Byron Jackson Machine Works kept at those Works which remained after the fire of 1906, other than the tracings you have told us about this morning?

Mr. LYON.—We object to that on the ground that unless it is limited solely as to whether this man knows anything about it. Other than the tracings and the orders that were then in hand.

A. The order file, I think was preserved and

(Deposition of Frank Jackson.)

turned over to the office which they opened for a temporary office.

Q. You mean the orders of 1906? A. Yes, sir.

Q. Which were then going through the shop?

A. Yes, sir.

Q. Are you able to give us any particular statement as to the year Mr. Palsmaier connected himself with the Byron Jackson Machine Works?

A. None other than I have testified.

Q. Did he handle the Pabst pump matters?

A. No; that was handled through my department.

Q. Do you know of your own knowledge anything that he had to do with those pumps at any time?

A. Not of my own knowledge.

Q. Do you know anything of your own knowledge that he had to do with the 1901 pump you have told us about, namely, the one installed in the hotel?

A. I cannot recall.

Q. Do you know of anything that he had to do with the pump which was tested out as to its lift of water, etc., which has been referred to as the experimental pump?

A. Other than possibly he might have gone over the figures [453] with Mr. Jackson, but I didn't see them.

Q. Do you know whether he did or not?

A. I don't know. He may have taken the data there. You never could tell when we were testing. There might have been several standing around.

Q. Do you know of your own knowledge whether he was connected with the shop in 1902?

A. I am reasonably certain that he was.

(Deposition of Frank Jackson.)

Q. Do you remember what part of the year?

A. I couldn't state.

Q. You don't know the part of the year?

The MASTER.—He said he did not know.

Q. (By Mr. BLAKESLEE.) In what condition were the Pabst pumps shipped to Milwaukee? I mean those after the first shipment to the Pabst Brewing Company?

A. The second order for Pabst pumps were made with a pump discharge casing, except for flanges, and I am reasonably certain those were shipped out of the shop, but I am not positive as to whether there was a tube shipped or not, or as to whether the shaft was shipped or not. I am not positive.

Q. As to which of the pumps subsequent to the first do you think the tube and shaft parts were shipped to Milwaukee?

A. It must be the second order.

Q. How about the third, fourth and fifth?

Mr. LYON.—Objected to as assuming a fact not testified to by the witness, that there was a third, fourth and fifth.

Mr. BLAKESLEE.—Counsel brought it out himself in cross-examination. He asked him if he did not understand that there were five Pabst pumps?

Mr. LYON.—Not five shipments or five orders. I asked him if there were five pumps. [454]

The MASTER.—They may have been all under one order.

Q. (By Mr. BLAKESLEE.) How about any of the pumps that were shipped after the first?

A. That is, as to when they had the casing tube?

(Deposition of Frank Jackson.)

Q. Yes, and the shafting.

A. I am reasonably certain that those were shipped, complete.

Q. Do you know of your own knowledge whether any testing was done at the shop of the Byron Jackson Machine Works, with respect to any of those pumps shipped to the Pabst people, subsequent to the first pump shipment to them?

A. Yes, sir.

Q. Can you tell us about any such testings?

A. The first Pabst pump was tested at the shop, but it was not set up vertically as the first deep tube pump was made, but was laid on its side and a pulley put on the shaft and the bearings bolted up and the elbow turned down from the end of the pump into the tank and the discharge taken out, and by means of an elbow, discharged back into the tank, the object being to determine whether the pump produced the pumping head and lift as to the quantity of water.

Q. What can you say in these respects as to the pumps shipped to the Pabst people—that is, with regard to any testing?

A. No testing, because we simply had the data necessary on the first one.

Q. Do you know what became of the pump which you said was installed in the hotel in San Francisco, in 1901, like the tracing Defendant's Exhibit 2?

A. You have to show me that. That part of the town was all burned up and the probabilities are that went into the junk pile, because everything was destroyed. [455]

(Deposition of Frank Jackson.)

Q. That hotel was destroyed?      A. Yes, sir.

Q. Do you remember the name of the hotel?

A. I do not, because it was more like an apartment house than a hotel.

Q. Can you recollect the names of anyone who worked on that hotel pump in 1901 during its construction?

A. I don't know whether I could name individuals who worked on it or not, because we had a shop full of men. There were seventy-five machinists there.

Q. Were any of those men in the employ of the Byron Jackson Iron Works to your knowledge in 1908?      A. I don't know.

Q. Do you remember any that were?

A. I know of one who probably was working there at that time, but he had nothing to do with that. He would be working there now if they were not on strike.

Q. Was this man you refer to killed there?

A. There was one man killed there. There was a man named Core that was proprietor of the shop.

Q. I notice among these tracings in Defendant's Exhibit 2 to 6, inclusive, to which you have referred to and identified, certain lettering such as on Defendant's Exhibit 4, "700 G. P. M." Do you know what that indicated?

A. G. P. M. suggests gallons per minute. That is a short way of abbreviating it.

Q. And on the same exhibit I see "1500 R. P. M."

A. That means revolutions per minute.

Q. Of what?      A. Of the rotating shaft.

(Deposition of Frank Jackson.)

Q. Where it says "200 feet A. L. T. D." [456]

A. The total pumping head of the pump.

Q. The height to which it would carry the water?

A. Yes, sir.

Mr. BLAKESLEE.—That is all, excepting the recall that may be necessary and which was reserved this morning for the purpose of introducing the sketch.

Cross-examination.

(By Mr. LYON.)

Q. You referred to a test of the first pump for the Pabst Brewing Company. According to your best recollection, when was that test made in the Byron Jackson Machine Works?

A. Early in 1903. I cannot tell you just the month.

Q. When you say "early" what do you mean?

A. It might have been in January, February or March.

Q. Are you sure it was not as late as June, 1903?

A. I don't think so.

Q. Now, these various tracings, some of which you have identified here to-day, were made for the making of the pump?

A. They were made in 1903, and I am reasonably certain that pump was made in 1903. It might have been in the middle of the year. I cannot recall that.

Q. In other words, what is your recollection regarding the tracings which will show the construction of that pump, which you have identified here

(Deposition of Frank Jackson.)

to-day, were they before or after the pump was made?

A. They were made before the pump was made.

Q. According to your recollection, there was this one pump shipped to Wisconsin and you understood it was for the Pabst Brewing Company?

A. Yes, sir.

Q. The next shipment, was there one pump or more than one? [457]

A. I think they were shipped as we completed them. I am not certain that we shipped them altogether.

Q. According to your best recollection, when did the second pump go out?

A. Some time in 1904; perhaps about the middle of 1904.

Q. You are reasoning that out, and that is your best recollection? A. Yes, sir.

Q. You have nothing particular to tie that circumstance to?

A. Other than this; that it was when Robb came back the first part of 1904 and we began the construction of those pumps.

Q. Of the second pump? A. Yes, sir.

Q. Did you make more than one pump for them at that time, or were there subsequent orders given for others?

A. We started in on three at that time. He brought back three orders.

Q. For three pumps? A. Yes, sir.

Q. You started in on three? A. Yes, sir.

Q. That was some time in 1904?



(Deposition of Frank Jackson.)

A. Yes, sir; to the best of my recollection.

Q. Did you finish three pumps during 1904, for the Pabst Brewing Company?

A. I am not positive about that.

Q. Are you sure that those orders called for or that you built three or two or one pump for the Pabst Brewing Company in 1904 with this enclosed line shaft feature, during the year 1904? [458]

A. I would say they were, to the best of my recollection.

Q. Are you sure that those orders that Robb brought back contained the enclosed line shaft?

A. Yes, sir; to the best of my knowledge the orders called for them.

Q. Is that the last order you had for the Pabst Brewing Company? A. I don't know.

Q. What is your recollection?

A. During my time with them—during the time I have in mind, there were five made, and I think in the first instance there was one made, then three made and then perhaps one after that.

Q. Then according to your present recollection, when was this fifth one made?

A. I could not attempt to locate that.

Q. Was it made during the year 1906?

A. No; it was prior to that, I think.

Q. Was it made in 1905?

A. Possibly in 1905, to the best of my recollection.

Q. Did you know where that pump was to go?

A. I never paid any attention to the shipping

(Deposition of Frank Jackson.)

after the pumps were created. I would not know where they went.

Q. How do you know that that was the pump for the Pabst Brewing Company?

A. Just from the order.

Q. Just the shop order? A. Yes, sir.

Q. Did you ever receive any information whatever yourself as to what happened to the first Pabst installation after it was put up? [459]

A. The only information I ever got from that was from Mr. Robb, that they had some objection to the oil going into the water.

Mr. BLAKESLEE.—We ask that that answer be stricken out on the ground that it is not a statement of facts and not a statement of knowledge. The question itself calls for the reception of information.

The MASTER.—Sustained.

Mr. LYON.—That is all. [460]

**Deposition of H. C. Robb, for Defendants.**

H. C. ROBB, a witness produced on behalf of defendant, being first duly sworn, testified as follows:

**Direct Examination.**

(By Mr. BLAKESLEE.)

Q. State your name, age, residence and occupation, Mr. Robb.

A. My residence is 706 North Figueroa Street, Los Angeles; age fifty-six; occupation, machinist.

Q. Were you at any time employed by the Byron Jackson Machine Works in San Francisco, California? A. Yes, sir.

(Deposition of H. C. Robb.)

Q. When?

A. From the late eighties till ten or twelve years ago. About eighteen years.

Q. From about 1908?

Mr. LYON.—Objected to as leading.

Q. (By Mr. BLAKESLEE.) What year did you leave there?

Q. (By the MASTER.) What year did you go to work for them? A. 1908.

Q. (By Mr. BLAKESLEE.) During that time in your connection with those people, what services did you perform for them?

A. Both inside and outside work, installing outside and erecting.

Q. What kind of things did you install for them?

A. All classes of pumps, engines—gas engines and steam engines.

Q. What kind of pumps?

A. Centrifugal and bored well pumps, both horizontal and vertical.

Q. Did you ever install any bored well pumps for them outside of California? [461]

A. Yes, sir.

Q. Where? A. In Milwaukee.

Q. When was that? A. 1903 or '04.

Q. Where in Milwaukee?

A. The Pabst Brewing Company.

Q. That is, in Milwaukee, Wisconsin?

A. Yes, sir.

Q. When did you go there to install that pump? What part of that year?

(Deposition of H. C. Robb.)

A. In the latter part of October I left San Francisco.

Q. Of what year? A. 1903.

Q. To your knowledge where was that pump before you installed it? Where did it come from?

A. The pump itself and the top work and the bearings were all made in San Francisco, and the tube, shafting and outside casings were made in Milwaukee.

Q. What do you mean, by this connection, by the outside casing?

A. The pipe that is called the column.

Q. Did you install that pump in Milwaukee?

A. Yes, sir.

Q. How was that tubing or column installed? How was it arranged and what did it do?

A. You mean the process of installation?

Q. No. When it was installed, what did it do? What was its purpose?

A. To deliver the water from the pump to the surface.

Q. What other parts can you remember of that pump as you installed it in Milwaukee? [462]

A. The shaft and the tubing containing the shaft, the bearings, the top works.

Q. Where were the bearings located?

A. Attached to the inner tube.

Q. And what was it that turned in those bearings?

A. The shafting delivering the power to the pump.

(Deposition of H. C. Robb.)

Q. Where did that shafting come from, if you know?

A. I bought the shafting in Chicago and shipped it to Milwaukee.

Q. Where did the tubing surrounding the shafting come from?

A. It came from Chicago. I bought it from different companies and shipped it to Milwaukee.

Q. Where did the bearings come from?

A. San Francisco.

Q. Under whose instructions did you proceed to Milwaukee?

A. My own, following the drawings supplied by the Byron Jackson Iron Works.

Q. Who furnished you with drawings for the Byron Jackson Iron Works?

A. The Byron Jackson Iron Works.

Q. Who of that company furnished you with those drawings?

A. Byron Jackson himself.

Q. And did you take those drawings with you to Milwaukee? A. Yes, sir.

Q. Do you know where those drawings are to-day?

A. They were returned back to the factory when I came back from Milwaukee.

Q. Please give us a brief description of the drawings you took to Milwaukee under your instructions to install this Pabst pump. [463]

A. They showed the tubing and shafting and bearings, and what to order for them and how they were to be arranged, with the threads and how the ends were to go on the shaft, the same as working

(Deposition of H. C. Robb.)

drawings to be supplied to any mechanic to do the work.

Q. How many lengths were there to the shaft?

A. Twenty feet.

Q. How many of those lengths? A. Ten.

Q. Do you remember the depth of the shaft?

A. The well itself was two thousand feet. The pump was set two hundred feet from the surface.

Q. What was the diameter of that well?

A. Fifteen inches.

Q. Do you remember the diameter of the tubing that enclosed the shaft? A. Four inches.

Q. Do you remember the kind of bearings that were used within the tube and within which the shafting turned?

A. They were cast iron, lined with Babbitt. The thread was turned on the cast iron and the thread was inside of the tube.

Q. And how were the lengths of tubing connected?

A. Screwed, ten feet apart with one bearing in between. The main pipe was twenty feet and the tubing was made in two sections of ten feet each.

Q. Do you remember anything else that was installed in connection with the casing and the tubing and the shaft and bearings?

A. If you want the details there was an oil hole drilled through the bearings to admit oil from one bearing to the other, [464] if a bearing choked up with oil.

Q. Do you remember any other parts of that pump or that installation?

(Deposition of H. C. Robb.)

A. There were spiders that carried screws to center it in the column.

Q. Where were those spiders placed?

A. At the top of each section.

Q. How were they held in place?

A. By the tube, vertically and by the setscrews centrally.

Q. What did the setscrews bear against?

A. Inside of the main column.

Q. That was the pump casing?

A. Yes, sir.

Q. What was the purpose of providing those setscrews there?

A. To bring the shaft in the center of the column.

Q. And to align it?      A. Yes, sir.

Q. Under whose instructions did you purchase the shafting and inner tubing in the east?

A. Mr. Byron's Jackson's instructions.

Q. When you were making this installation for which you went to Milwaukee in October, 1903, whom did you meet at the plant of the Pabst Brewing Company at Milwaukee?

A. I met the president of the company and the superintendent, but I don't remember their names.

Q. Anybody else?

A. The men at the shop where I did the work on the material.

Q. Was that a Pabst Company repair shop or an outside shop? [465]

A. The name of that shop was the Andrew Kopperrood. I don't know how to spell it.

(Deposition of H. C. Robb.)

Q. And what work did you do in that Kopper-rood shop?

A. I threaded the shafting and the tubing and the outside casing. I assembled the pump on the sidewalk and dismantled it and transported it to the Pabst plant and installed it.

Q. And where did you put the ten lengths of shafting together? A. In the well.

Q. How were they connected together?

A. With left-hand thread screw nuts.

Q. In connection with making that installation at Milwaukee, did you consult or confer with anybody else there? A. Absolutely not.

Q. Do you remember who was in charge of the part of the Pabst works where you put this pump in?

A. I would recognize the name if I heard it, but I can't recall the name now.

Q. How long did it take you to complete that installation?

A. About sixty days. There was considerable delay in getting the 9-inch casing. What I had on hand, I finished long before we got the casing.

Q. Had that well been drilled prior to your leaving and finishing?

A. Yes, sir; and used by compressed air.

Q. How high did the water stand in that well?

A. One hundred feet, with the pump standing. It went to two hundred feet with the pump running.

Q. Please tell us what you did after you got the parts of the pump installed and in position in the well.



(Deposition of H. C. Robb.)

A. I put the belt on the engine and saw that the oiling [466] device was in order and started up, delivering the water on the street for a period of several days before it was used in the plant.

Q. What was the delivery arrangement of the water from that well casing?

A. It went into the horizontal line and was carried a block or a block and a half to their reservoir.

Q. Do you remember what the revolutions per minute that pump made?

A. Practically twelve hundred.

Q. How about the gallons per minute discharged?

A. Seven hundred gallons.

Q. And what head? A. Two hundred feet.

Q. Now, after you had tried it out that way, pumping the water out into the street, what took place?

A. The pumping was connected with the reservoir and they commenced to use it for the purpose of purifying the kegs, as with steam.

Q. They used the water for purifying tanks?

A. No; the kegs. The well water was not used for making beer. They used the lake water. One was used for cleaning the kegs and the other was used for manufacturing beer.

Q. Was that pump operated right along after you connected it up with the reservoir, till you left there?

Mr. LYON.—Objected to as leading and suggestive.

Q. (By Mr. BLAKESLEE.) Strike it out.

(Deposition of H. C. Robb.)

What have you to say as to the continuity of operations after it was started up and connected with the reservoir?

A. We ran it for sixty days or more. It was over sixty and less than ninety days, and then I left.  
[467]

Q. What period of time per day was the pump operated? A. Twenty-four hours.

Q. How much of that time were you in the observation of the operation of the pump?

A. Three or four hours every day.

Q. Each of those days during the sixty or ninety days? A. Yes, sir.

Q. Were there or were there not any troubles encountered in the operation for that period?

A. Only with the oiling device.

Q. What was that oiling device for? What did it lubricate? A. The bearings.

Q. Where were they?

A. Ten feet apart on the column.

Q. What trouble did you have with that?

A. The oil was found to be detrimental to the cleaning of the kegs and we stopped using the oil and used city water to lubricate the bearings.

Q. Where was that oil put in when you used it?

A. At the top inside of the 4-inch tubing.

Q. That is, the shaft enclosing the tube?

A. Yes, sir.

Q. To conduct it to that place from what source?

A. From the oil container at the top. With small piping.

Q. How long was it run with that oil lubrication

(Deposition of H. C. Robb.)

before they stopped that lubrication?

A. Between two and three weeks, as near as I can remember.

Q. Did you note any change in the efficiency of its operation after the oil lubrication was terminated?

A. The question of efficiency was not raised. There [468] was no occasion to note whether it made any difference in power or not.

Q. The water that you used for lubricating purposes, came from another source?

A. Yes, sir; it came from the city. I insisted on its being strained through a settling tank which we made, to be sure that it was clear water.

Q. Was there any packing provided in that pump for the shaftings?

Mr. LYON.—Objected to as leading and suggestive.

Q. (By Mr. BLAKESLEE.) To your knowledge?

The MASTER.—Answer the question.

A. There was a packing gland at the pump.

Q. At which end?

A. The top of the pump.

Q. And what did that pack? A. The shaft.

Q. Where was the stuffing-box mounted?

A. At the top of the pump casting. It was packed below the shaft line proper. It would be the first shafting on the pump.

Q. Any other packing or stuffing-box used on the pump? A. On the top.

Q. Where was that placed?

(Deposition of H. C. Robb.)

A. Around the 4-inch casing to keep the water in.

Q. To keep the water in where?

A. In the pump column.

Q. And that confined it to the discharge, through a horizontal pipe?

Mr. LYON.—Objected to as leading and suggestive.

The MASTER.—Sustained. [469]

Q. (By Mr. BLAKESLEE.) How did that confine the water—that last packing at the top?

A. It was packed around the 4-inch casing to prevent the water from going from the outside line into the atmosphere.

Q. While you were back in Milwaukee on this trip that you have told about, did you communicate with the home works of the Byron Jackson Machine Works at San Francisco? A. Yes, sir.

Q. What communication did you have with them?

Mr. LYON.—We object to that.

Q. (By the MASTER.) Was it a letter or telegram or what?

A. Both by mail and tēlegraph.

Q. (By Mr. BLAKESLEE.) Do you remember when it was that you communicated with them?

A. Not to be sure of the date. One was when we got the pump accepted.

Q. And when was that? A. Early in 1904.

Q. What was that, a letter or telegram?

A. Both.

Q. Do you know where that letter and telegram are to-day? A. No.

Q. Can you state the substance of them?

(Deposition of H. C. Robb.)

Mr. LYON.—Objected to as incompetent and not the best evidence and no foundation laid for the introduction of secondary evidence.

Q. (By Mr. BLAKESLEE.) Do you know where any of those communications are that you mentioned—letters or telegrams?

A. Unless they would be in the records of the telegraph company or in the Byron Jackson office.

Q. Have you ever seen them since? [470]

A. No.

Q. Now, can you state what was contained in those communications?

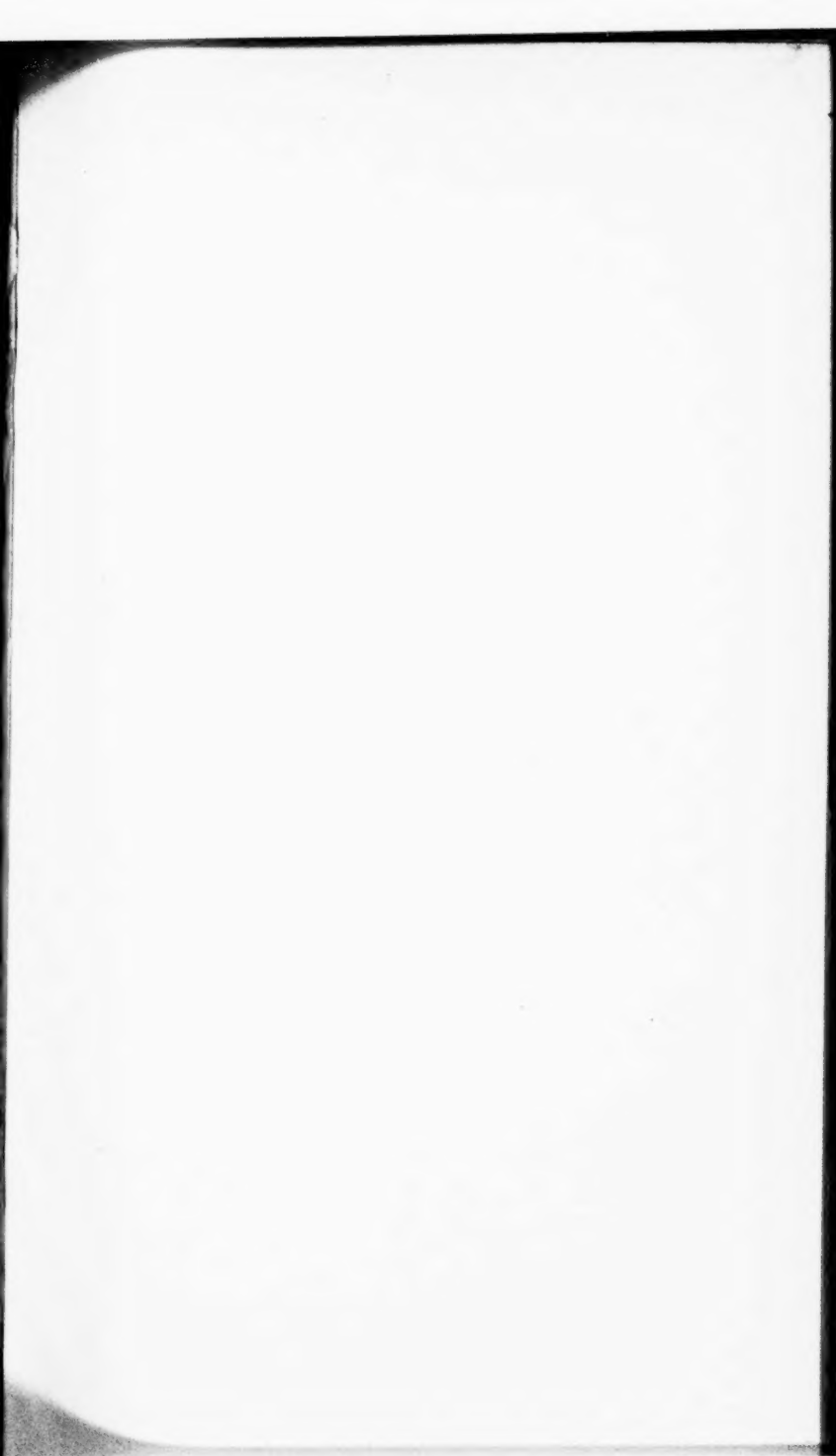
Mr. LYON.—We object to it on the ground that it is incompetent and no foundation laid, secondary and no effort has been shown as made to produce them.

Mr. BLAKESLEE.—We have shown that the papers of the company and the works were destroyed. It seems to me there could not be any better foundation laid. Mr. Keating has no record, and Mr. Jackson says there are none, and Mr. Thomas and Mr. Forward could not produce anything besides these tracings. We have laboriously laid the foundation as to the records of the Byron Jackson Machine Works.

Mr. LYON.—Mr. Keating says it would take from thirty to sixty days to make a search to find the records. There is nothing to show that you made even a request for these particular communications.

Mr. BLAKESLEE.—We have requested them to produce everything that they can produce.

The MASTER.—Maybe the witness has copies.



**Vol. II**  
**TRANSCRIPT OF RECORD.**

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**SUPREME COURT OF THE UNITED STATES**

**OCTOBER TERM, 1932.**

**No. 278.**

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**LAYNE & BOWLER CORPORATION, PETITIONER,**

**vs.**

**WESTERN WELL WORKS, INC.; ROTARY DRILLING AND  
DEVELOPMENT COMPANY, STANLEY M. HALSTEAD,  
ET AL.**

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**ON WRIT OF CERTIORARI TO THE UNITED STATES CIRCUIT COURT  
OF APPEALS FOR THE NINTH CIRCUIT.**

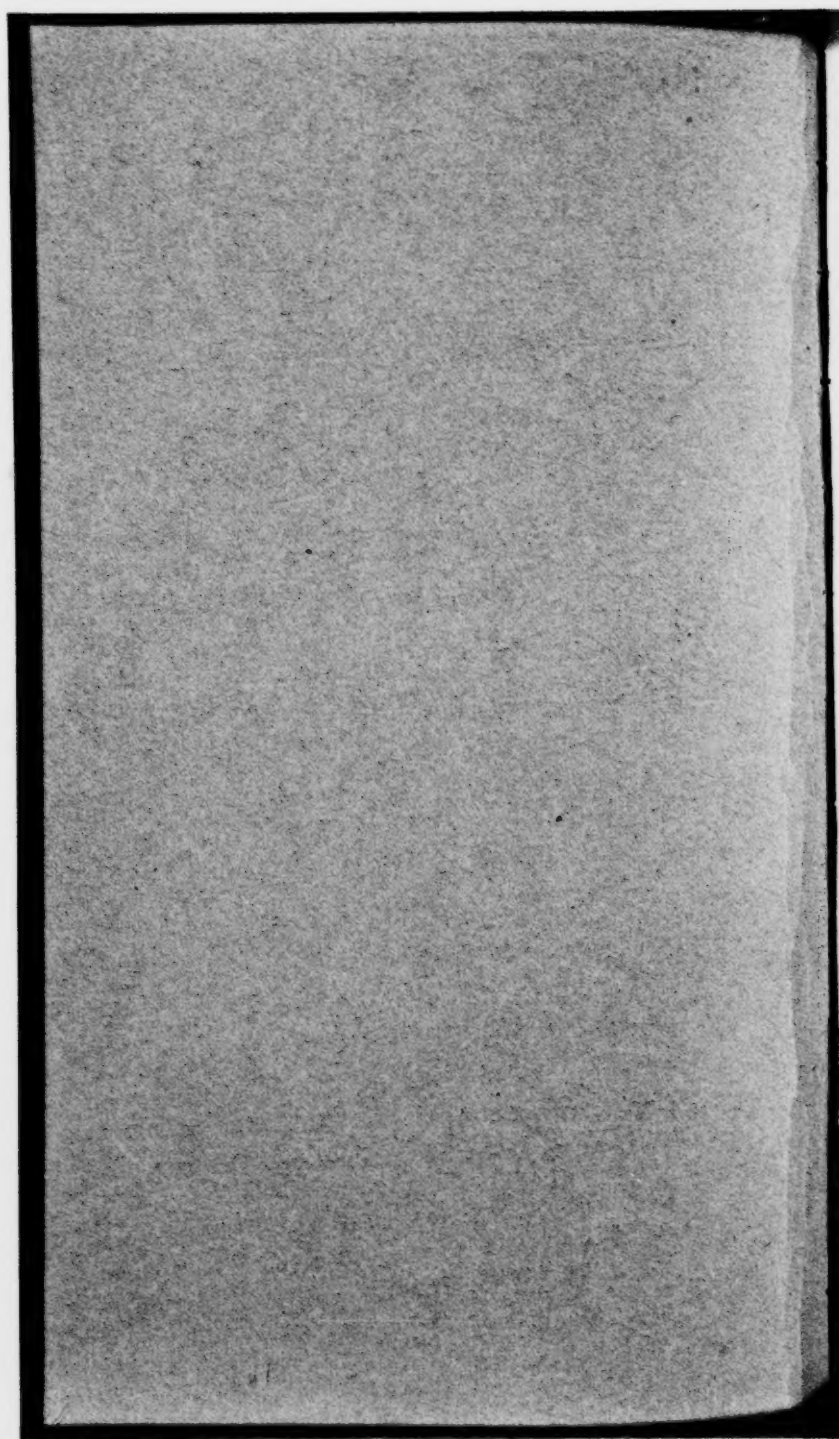
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**PETITION FOR CERTIORARI FILED FEBRUARY 24, 1933.**

**CERTIORARI AND RETURN APRIL 24, 1933.**

**(28,722)**





(Deposition of H. C. Robb.)

Q. (By Mr. BLAKESLEE.) Have you copies of those letters or telegrams? A. No, sir.

Q. Did you make copies at the time? A. No.

Q. Can you now state what was contained in the letters or telegrams?

A. I can in substance but not in detail. It pertained to the operation of the pump, and that the pump had been accepted, and that I was on my way home bringing an order for more pumps. [471]

Mr. LYON.—We object to the statement as not responsive and upon each of the grounds stated; that it is incompetent, not the best evidence, and no foundation laid for the introduction of secondary evidence.

Q. (By Mr. BLAKESLEE.) You say you recollect the substance of that letter and telegram. Will you state what such substance was?

Mr. LYON.—We repeat the objection.

The MASTER.—Now, Mr. Lyon, what better can you suggest?

Mr. LYON.—They have not made any showing that the letters this man refers to or the telegram, does not exist among those files. The main thing that would be valuable at all, is dates. So, what is the materiality of the letter otherwise? We object to it on the ground that it is immaterial.

Mr. BLAKESLEE.—It was early in 1904 and shows what he did then about this test.

The MASTER.—Did you give those letters or telegrams to the Pabst Brewing Company to send Byron Jackson, or did you send them yourself?

A. I sent them personally.

(Deposition of H. C. Robb.)

Q. (By Mr. BLAKESLEE.) You don't know that they had any copies of them at all?

A. No; they would not have any, excepting the last communication that I took for the contract for more pumps. The Pabst Brewing Company would have a record of that.

Q. (By the MASTER.) Anything that you sent to the Byron Jackson Company, you know of no copies of them?

A. The only place that I would know where to look, is with the Telegraph Company copies on file of messages sent.

Q. (By Mr. LYON.) Have you made any search for any copies whatever of that telegram or letter?  
[472] A. No.

Q. Have you made any effort at all to find them?

A. I didn't know that the question would be raised and had no occasion to look for them.

Mr. BLAKESLEE.—We have proven that the shop records, except the tracings were destroyed.

The MASTER.—The testimony is that there was a fire in San Francisco and that all the records of the Byron Jackson Machine Works except tracings and one or two other items were destroyed.

Mr. LYON.—Mr. Keating's testimony does not so show. It shows that they have a large number of records and it is not shown what those records are. I agree with you that Mr. Jackson said there was nothing but tracings. Mr. Keating's testimony was that they have other records besides that.

Mr. BLAKESLEE.—He was not there then and does not know.

(Deposition of H. C. Robb.)

Mr. LYON.—We stand on the objection. The only material part of this thing, if it is material for any purpose, is to prove a date, and even that is hazy. The witness does not pretend to be able to give the date of it. And it can be fixed doubtless, by the subsequent contract.

The MASTER.—That can be shown at the Pabst Brewing Company. But the mechanics who were sent to install the machinery, whose report—

Mr. BLAKESLEE.—The report was a part of the performance of his duty and we want to know the nature of his report.

The MASTER.—The objection is overruled.

Mr. LYON.—Exception.

(Question is read.)

A. The telegram was to the effect that the pump had been accepted and an order given for more pumps and the payment for [473] the pumps I was bringing home.

Q. (By Mr. BLAKESLEE.) Where did you get that payment?

A. At the Pabst Brewing Company plant.

Q. What was the nature of the payment? In what form? A. A check.

Q. By whom was it drawn?

A. By the President of the Pabst Brewing Company.

Q. In favor of whom?

A. Byron Jackson Iron Works—Byron Jackson Machine Works.

Q. (Mr. BLAKESLEE.) Was it "Iron Works" or "Machine Works"?

(Deposition of H. C. Robb.)

Mr. LYON.—Objected to as leading.

Mr. BLAKESLEE.—He has already corrected himself. What was the amount of money appearing on the face of that check?

A. I don't remember now. It was over \$500.00, but just how much I don't recollect.

Q. Now, you have mentioned certain orders given you at the same time, namely, upon the acceptance of this Pabst pump, and at the time of the payment for the same. At the time you received this check, what were the orders you received?

A. An order for three more pumps.

Q. (By Mr. LYON.) Was that in writing?

A. (By Mr. BLAKESLEE.) In what form did you receive those orders? A. A written order.

Q. Who delivered it to you?

A. The president of the company.

Q. At the office of what?

A. The office of the Pabst Brewing Company.

Mr. LYON.—We object to so much of the witness' statement as contains the statement of what the orders contained or what it was for, as incompetent, and not the best evidence and no [474] foundation laid for the introduction of secondary evidence. I move to strike that portion from the record.

The MASTER.—The objection is sustained and the motion granted.

Q. (By Mr. BLAKESLEE.) Did you have any discussion with the Pabst people about these further orders that you mentioned? Did you take part in any talk concerning it? A. Yes, sir.

Q. What took place.

(Deposition of H. C. Robb.)

Mr. LYON.—Objected to as incompetent, it not being shown that the party plaintiff or anybody representing him was present, and it cannot be binding in any manner upon the plaintiff inasmuch as all of this took place, according to the testimony of the witness, approximately a year after the date upon which the application for the patent in suit was filed, and it cannot be any part of the defense of prior invention, or competent to prove prior invention.

Mr. BLAKESLEE.—It is part of our defense of prior invention, in that it shows the carrying on of this invention and the commercial and continued commercial use. And part of our further defense that both the plaintiffs and defendants in this case have used substantially the construction so installed at Milwaukee, and not the construction of the Layne patent in suit.

The MASTER.—The principal objection to the testimony is that the plaintiffs were not there at all, and, furthermore, there is evidently a writing of it in somebody's possession.

Mr. BLAKESLEE.—I didn't wish to lead the witness, but if the order was given to him other than by this writing, or in addition to the writing, he can testify as to that.

Q. What took place when you received these orders?

Mr. LYON.—The same objection in regard to that.  
[475]

The MASTER.—With reference to the conversation, the objection is sustained.

Q. (By Mr. BLAKESLEE.) Omit any con-

(Deposition of H. C. Robb.)

versation. What took place when you received the order for the three further pumps? Where did you receive them and what took place?

A. It took place in the president's private office; some specifications were a little different from the contract that had been made before.

Mr. LYON.—The last statement in regard to any specifications, we move to be stricken from the record and excluded from consideration on the ground stated in the objection to the question.

Q. (By Mr. BLAKESLEE.) What were the specifications you refer to?

A. Regarding the balancing.

The MASTER.—If they were specifications in writing, there must be some writing about it and that is the best evidence.

Q. (By Mr. BLAKESLEE.) What did you do with these orders which you received from the vice-president's office?

A. I carried them in my pocket to the Byron Jackson Iron Work's Office.

Q. What was the nature of those orders? What were they? Papers, drawings or what?

The MASTER.—You need not give the contents of the orders, but were they orders, or drawings or specifications?

A. In contract form, an order for three pumps.

The MASTER.—The order for three pumps will be stricken out.

Q. (By Mr. BLAKESLEE.) What did you do with this matter that you received any contract for?

(Deposition of H. C. Robb.)

A. Delivered it to the Byron Jackson Machine Works.

Q. When you delivered it or after you delivered it, do you remember anything further that occurred in the Byron Jackson [476] Machine Works in connection with enclosed shaft pumps?

Mr. LYON.—Objected to as leading and suggestive.

The MASTER.—What did the Byron Jackson Machine Works ever do? Did they abandon the pump or go on with it?

Mr. LYON.—I don't know. That is what we want to know.

The MASTER.—I can't answer it and you can't answer it, but what did the Byron Jackson Machine Works do with reference to that kind *or* pumps?

Mr. LYON.—With reference to this order?

Mr. BLAKESLEE.—I am not talking about the order, because that is one part we have not been permitted to inquire.

The MASTER.—What did they do with reference to that kind of shaft pump?

Q. (By Mr. BLAKESLEE.) What was done at the Byron Jackson Machine Works with reference to that kind of enclosed shaft pumps?

A. They were manufactured continuously.

Q. How soon after you came back was there anything of that sort done?

A. They were manufactured all the time.

Q. For how long a period?

A. As long as I was there.

Q. Do you remember any concern for whom such

(Deposition of H. C. Robb.)

enclosed shaft pumps were built after you returned from Milwaukee?

Mr. LYON.—We object to that as leading and suggestive, and if the term “such enclosed line-shaft pumps, means anything in this connection,” it is putting it absolutely in the mouth of the witness—the entire construction which is in issue, and if it don’t, it is immaterial.

Mr. BLAKESLEE.—Leave out the word “such” and make it “enclosed line-shaft pump.”

The MASTER.—What was done after you came back from [477] Milwaukee with reference to the manufacture of enclosed line shaft pumps?

A. They were manufactured whenever they could get an order, and they were manufactured up to the time that I left eight years ago.

Q. How did they compare with this pump you put in for the Pabst people at Milwaukee?

A. There were very little changes made; no change in the tubing or shafting construction.

Q. Do you remember the names of any persons or parties for whom the enclosed shaft pumps were built for the Byron Jackson Iron Works after you returned from Milwaukee?

A. I can state those that I installed pumps for.

The MASTER.—State it.

A. The Lagrange Service Company, the Schlitz Brewing Company of Milwaukee. The Southern Pacific Railway Company in Santa Clara County, California, the Santa Fe Railroad at Richmond.

Q. (By Mr. MONTGOMERY.) What period have you covered in this question?



(Deposition of H. C. Robb.)

Mr. LYON.—After he left Milwaukee, till he left there in 1909.

A. That is all I can recall, for the time being.

Q. (By Mr. BLAKESLEE.) Please state the number of steps or stages in the pump you installed for the Pabst people. A. Four stages.

Q. Do you remember the diameter of the bowls?

A. Fourteen inch, I think, in a fifteen-inch well.

Q. Do you remember when this Lagrange pump was built?

A. In 1905, one of them. In 1906, I think was another.

Q. Do you remember anything in detail as to those pumps, that is, as to sizes and the number of stages? [478]

A. At Lagrange the well was down a hundred feet. I had a twenty-five (25 H. P.) horse-power motor on it connected directly.

Q. How many stages? A. Three.

Q. Do you know who installed that pump?

A. I did.

Q. For whom?

A. The Lagrange Service Company.

Q. Under whose instructions did you go to install it? A. The Byron Jackson Machine Works.

Q. Do you remember the revolutions per minute of the shaft of the Lagrange pump?

A. 1150, I believe.

Q. How about the number of gallons per minute delivered? A. I don't remember the number.

Q. Do you remember the head?

A. A hundred feet?

(Deposition of H. C. Robb.)

Q. Prior to your trip to Milwaukee in 1903, do you remember any other pump at the Byron Jackson Machine Works with an enclosed shaft?

Mr. LYON.—We object to that as exceedingly leading and suggestive and particularly vicious, and I protest against the conduct of the examination in the manner to suggest to the witness everything it is that he wants him to testify to.

The MASTER.—Let him describe the pump.

Mr. BLAKESLEE.—We insist that this examination has been most open. I am simply trying to save time.

The MASTER.—The objection is sustained.

Q. (By Mr. BLAKESLEE.) Please tell us about any other bored-well pump that you remember at the shop of the Byron Jackson [479] Machine Works prior to your trip to Milwaukee in 1902.

A. I can't recall any other pumps that were made or shipped before that time, except the pump that was on the floor while I was away and, when I returned I was given the upper part of the frame to make other tests with, but not with the pump itself.

Mr. LYON.—Unless it is stipulated that the last answer of the witness simply means that he found some pump there on his return, we move to strike the answer from the record and exclude it from consideration as incompetent, as the witness clearly cannot know anything about what was on the floor of that shop while he was away.

The MASTER.—He can tell what he found there.

Mr. LYON.—That is all the testimony can stand for.

(Deposition of H. C. Robb.)

Mr. BLAKESLEE.—What was the nature of the pump you found on the floor? Briefly describe it.

A. It was a pump with an enclosed shaft.

Q. When was the first time you saw that pump?

A. In 1902.

Q. That is before you went to Milwaukee?

A. Yes, sir.

Q. (By Mr. BLAKESLEE.) Now, what was its condition when you first saw it, and where was it?

A. It was in the tank of a pulley frame on the floor above.

The MASTER.—At the Byron Jackson Works, do you mean? A. Yes, sir.

Q. (By Mr. BLAKESLEE.) What was its position with respect to being horizontal or vertical?

A. It was sitting vertically over the tank, discharging through piping with a valve on it and then back to the tank.

Q. Can you name or fix the time in 1902? [480]

A. Not to be positive about it, no.

Q. And what to your recollection was the make-up or construction of that pump?

A. I didn't see the drawings and I cannot say how it was made.

Q. What did you see when you looked at it pumping water?

A. The shells and the discharge pipe on the shaft.

Q. What part of the shaft could you see?

A. That it was connected with the pulley frame.

Q. When you saw it lying on the floor, what did you observe?

A. I don't remember any of the details on it.

(Deposition of H. C. Robb.)

There was nothing to bring it forcibly to my mind at that time.

Q. When you found it there did you see it?

A. Yes, sir.

Q. And that is how you came to find it—by seeing it?

A. Yes, sir; and there was more or less discussion among the employees, what the result of the test was.

Q. Tell us what parts you saw?

A. It looked similar to the Pabst pump, and I had drawings of those.

Mr. LYON.—I move to strike the last answer from the record as a mere conclusion of the witness, incompetent and not proper evidence.

The MASTER.—You cannot compare it with some other pumps.

Mr. BLAKESLEE.—He can state that it was like some. That is the impression his mind got. Now, I will ask him to state in what respect was it similar or how was it constructed.

A. The bowls were similar to what was constructed for the Pabst pump, and the shafting and packing were similar to those used in the Pabst pump.

Q. Where was the packing box? [481]

Mr. LYON.—I make the same motion with regard to that answer.

The MASTER.—The motion is denied.

Mr. LYON.—Exception.

Q. (By Mr. BLAKESLEE.) Where was the packing box?

A. I don't believe I could recall. I did not go into it to the bottom.

(Deposition of H. C. Robb.)

Q. How was the shaft enclosed?

Mr. LYON.—Objected to as leading and suggestive.

Mr. BLAKESLEE.—He said it had an enclosed shaft.

A. I don't know what the details were. I was away a great deal at that time.

Q. Do you remember any other details of it?

A. Not of that pump?

Q. Did you see it at any time when it was taken apart? A. No, sir.

Q. How long a period of time did you observe it pumping water?

A. I did not see it pumping much water—not to exceed two hours.

Q. When did you arrive back at San Francisco with the check you have told us about and the further orders from the Pabst people?

A. In the early part of April, 1904.

Q. And whom did you see when you returned to the shop? To whom did you make your report at the Byron Jackson Machine Works?

A. Byron Jackson himself.

Q. To whom did you deliver the order from the Pabst people and the check?

A. Byron Jackson in person. [482]

Mr. LYON.—We will object to putting before the witness any drawings or tracings present here unless the foundation is first laid to show that the witness has any knowledge of the drawings etc., particularly with any of the old records.

Mr. BLAKESLEE.—Q. You have spoken about

(Deposition of H. C. Robb.)

certain tracings or drawings you took to Milwaukee with you in 1903. Do you know what became of them or where they are?

A. I returned them to the Byron Jackson Machine Works.

Q. Have you seen them since? A. Yes, sir.

Q. When?

A. At different times while I was in their employ.

Q. Since you left their employ have you seen them?

A. Yes.

Q. When? A. Recently.

Q. How often did you see them while you were with the Byron Jackson people?

A. Whenever I was detailed on that work.

Q. I show you a tracing which is in evidence as Defendant's Exhibit 4, covering up the dates and data at the corner, and ask you if you have ever seen this tracing before.

A. I have only seen the blue-print and not the tracing.

Q. When did you last see a blue-print of this?

A. I don't know. A long time ago.

Q. How long ago?

A. I couldn't say. Ten years, probably.

Q. When did you first see a blue-print of this tracing?

A. While the pump was being manufactured. That would be in 1902 or '03. I think it was 1903 when I first saw it.

Q. What pump do you refer to? [483]

A. For the Pabst plant.

Q. Where did you see it?

(Deposition of H. C. Robb.)

A. Both in the factory at San Francisco, and in Milwaukee in my daily work.

Q. What drawings or tracings did you use to put together and assemble the pump for the Pabst people when you went East?

A. The drawings supplied by the Byron Jackson Machine Works.

The MASTER.—And that was a blue-print?

A. Yes.

Q. And not that original tracing?

A. Not this tracing.

Q. (By Mr. BLAKESLEE.) Was there any comparison between that blue-print and this tracing?

A. Identical, so far as I can observe from a casual inspection.

Mr. LYON.—I would like to ask the witness this question: This is the only drawing that you had? A blue-print of this, that you had with you at that time?

Mr. BLAKESLEE.—We object to that at this time. He said he had drawings. We don't believe he should be cross-examined on a number of drawings until we get through.

Mr. LYON.—We don't think that the witness should have a number of drawings that he may never have seen before, so far as appears from the evidence. He had some blue-prints at different times—we don't think that the witness should have presented to him a number of drawings and then be simply asked to state whether or not he had ever seen a certain blue-print or drawing before. He

(Deposition of H. C. Robb.)

ought to lay some foundation, so that the Master may judge of what he does recollect.

Mr. MONTGOMERY.—It is his own question. I don't think [484] there should be any discussion. Mr. Lyon has asked a question. Let the witness answer.

Mr. BLAKESLEE.—He has specified that he returned those to the Byron Jackson Machine Works.

The MASTER.—The objection was as to the foundation, and you disagree among yourselves, on that proposition.

Mr. MONTGOMERY.—Let him answer the question.

Mr. BLAKESLEE.—All right.

Q. (By Mr. LYON.) Now, when you were in Milwaukee assembling this pump for the Pabst Company, how many blue-prints did you have?

A. Three, I believe.

Q. And do you think that this one that you have identified here was one of them? A. Yes.

Q. Now, tell us what the others were, in a general way.

A. There were the top works and the other was the shaft and tubing.

Q. Were those on one sheet or two different sheets?

A. I think they were on two different sheets.

Q. Have you seen any of those at different times?

A. Yes, sir.

Q. Are you sure they were the same prints?

A. They were different sizes.

Q. (By Mr. BLAKESLEE.) Did you use them



(Deposition of H. C. Robb.)

on the Schlitz Brewing Company job?

A. I was not there in installing.

Q. You did not have anything to do with that.

A. No, sir; only getting the order.

Mr. LYON.—I suggest that you ask the witness to pick them out here if he can identify them.  
[485]

Mr. BLAKESLEE.—There are about thirty prints, and I am asking him to identify the drawings. I show you a tracing, Defendant's Exhibit 5, and ask you if you ever saw the same before.

A. Yes, sir; that is for the Pabst Brewing Company plant.

Mr. BLAKESLEE.—Let the record show that the date and data on the corner of the sheet were likewise covered up.

Q. When did you first see this tracing, exhibit 5?

A. This is the first time I have seen the tracing. I worked by the blue-print.

Q. How did the blue-print compare with this tracing?

A. The same so far as I can observe without taking lots of time to detect any difference.

Q. Similarly I show you a tracing, being part of Defendant's Exhibit 6, and identified as 3-E-22, covering up the dates and data in the corner thereof, and ask you if you have ever seen that before.

A. This is the top works of the Pabst plant.

Q. Did you ever see this tracing before?

A. Not the tracing; the blue-print.

(Deposition of H. C. Robb.)

Q. How did the blue-print compare with the tracing? A. The same.

Q. When did you first see such blue-print?

A. When they were submitted as working drawings in 1902 or '03.

Q. For what purpose? A. Manufacturing.

Q. At the shop of the Byron Jackson Machine Works? I would like to state, before producing any further tracings, that we do so only after having a description verbally made in full by this witness of what he installed. And I didn't lay them before him until he had. He says he only had three blue-prints, [486] in the installation that he made. So it would not in any sense educate him in that construction.

The MASTER.—If he wants to identify any more, show him it.

Mr. MONTGOMERY.—If he looks at those tracings they show on their face, and he can easily identify them, and he has testified to another pump.

The MASTER.—Except the one that was on the floor, he has not identified any other pump.

Mr. MONTGOMERY.—He testified that he installed one at Lagrange, Illinois.

The MASTER.—Is the drawing for that pump here?

Mr. MONTGOMERY.—Yes, sir.

Mr. LYON.—He has not described that one.

Q. (By Mr. BLAKESLEE.) With respect to the Legrange installation in 1905, what did you work from in installing it?

A. That was all manufactured in San Francisco,

(Deposition of H. C. Robb.)

so I did not have any drawings to install it.

Q. You did not use any drawings in connection with it at all? A. No, sir.

Q. Did you see any drawings used in connection with its manufacture before you installed it?

A. No; only in the shop—the shop drawings.

Q. Have you ever seen those drawings since?

A. Only in the shop.

Q. Never have seen them since you left the shop?

A. No, sir.

Q. I show you Defendant's Exhibit 6, or part of same, numbered 1-E-137, covering up the data and dates in the corner, and ask you if you have ever seen the same before? Have you ever seen this tracing before? [487]

Mr. LYON.—He said it was the Lagrange pump.

The MASTER.—He says he never saw it before.

Mr. LYON.—We move to strike out on the ground that it is not responsive.

The MASTER.—Stricken out.

Q. (By Mr. BLAKESLEE.) Have you ever seen this tracing before?

A. Not the tracing itself, but the blue-prints from it.

Q. How did the blue-prints compare with it?

A. The same.

Q. When did you see them?

A. The year the pump was manufactured, in 1905.

Q. And you saw the blue-print where?

A. In the factory at San Francisco.

Q. Do you know what this tracing shows?

(Deposition of H. C. Robb.)

The MASTER.—He said they made the pumps from it.

Mr. BLAKESLEE.—That ought to be enough. Counsel may inquire. [488]

H. C. ROBB, recalled.

Direct Examination (Resumed).

Q. (By Mr. BLAKESLEE.) I show you three photographs and ask you if you know what they are.

A. These are photographs that I took of the Pabst plant at the time of installation.

Q. You took them personally? A. Yes, sir.

Q. You mean the Pabst plant you have told us about—the pump you installed? A. Yes, sir.

Q. When did you take them?

A. January, 1904.

Q. I notice on the reverse side of one of them, a date "January, 1903." What does that signify?

Mr. LYON.—We object to that as incompetent, no foundation laid and done simply to coach and educate the witness, so far as the testimony of the witness so far shows.

The MASTER.—The objection is sustained. There is no foundation laid.

Q. Do you know who put the writings on the reverse side of this photograph? A. I did.

Q. (By Mr. BLAKESLEE.) What does this writing signify?

Mr. LYON.—I object to that on the same ground.

The MASTER.—When did he put it on?

Q. (By Mr. BLAKESLEE.) When did you put these writings on?

(Deposition of H. C. Robb.)

A. Several months after I took them, when I first commenced to accumulate I saw the necessity of putting it on the [489] back.

Q. Where did you put these writings on?

A. In San Francisco.

Q. Now, I refer to this photograph which has on its reverse side some matters in bluish writing. What does the date "Jan., 1903" signify?

Mr. LYON.—Objected to as incompetent and no foundation laid.

The MASTER.—Is that a foundation, simply to ask a witness to look at a thing and state what it signifies? He said he put it on several months afterwards. And it don't say whether it was correct or incorrect?

Mr. BLAKESLEE.—I suppose that will follow. I am willing for it to go as it is, only it is an obvious error and I wish to correct it.

The MASTER.—Ask him if he put it on and whether it is correct or not.

Mr. BLAKESLEE.—Unless we know what it signifies, how can we know anything about its correctness? What does that signify, and state, please, in that connection, what you had in mind in making that writing on there.

Mr. LYON.—The same objection.

The MASTER.—The objection is sustained.

Q. (By Mr. BLAKESLEE.) Is that date on there correct or incorrect? A. It is not correct.

Q. What should the date be?

A. January, 1904.

(Deposition of H. C. Robb.)

Q. And so corrected, what does that signify—by “January, 1904”?

Mr. LYON.—The same objection.

The MASTER.—Overruled. [490]

Mr. LYON.—Exception.

The MASTER.—I don't think it is proper to show it to witness and ask what it signifies.

Q. (By Mr. BLAKESLEE.) What date did you intend to have there?

Mr. LYON.—The same objection.

The MASTER.—Sustained.

A. The date the pump was installed.

Q. (By Mr. BLAKESLEE.) What date was this pump installed? A. January, 1904.

Mr. BLAKESLEE.—We offer these photographs in evidence and ask that they be marked Defendant's Exhibits 7, 8, 9, respectively, marking the one having the blue pencil markings on the reverse side as exhibit 7.

Mr. LYON.—Objected to as incompetent and no foundation laid and irrelevant and immaterial.

Mr. BLAKESLEE.—The witness has not the pump here.

The MASTER.—He didn't say anything about what installation, where he took it and when he took it and whether it was at the time of installation or months after.

Mr. BLAKESLEE.—He said he took it of the installation which he personally completed in that month.

Mr. LYON.—I did not so understand his testimony.

(Deposition of H. C. Robb.)

The MASTER.—He don't state whether it is correct likeness, of anything, or where it was taken.

Q. (By Mr. BLAKESLEE.) Where did you take these photographs?

A. Milwaukee, at the Pabst Brewing plant.

Q. And you say you took them personally?

A. Yes, sir.

Q. And what sort of a camera did you use?  
[491]

A. There were two different cameras; one was a 3-A, I believe they call it.

Q. Do you remember the plates you used, as to their receptiveness to actinic action?

A. It was a roll film.

Q. Was the camera and all the apparatus at that time in working condition?

Mr. LYON.—Objected to as leading and suggestive.

The MASTER.—It is leading.

Q. (By Mr. BLAKESLEE.) What was the condition of the camera and the rest of the photographic apparatus with which you took these photographs at the time you took them?

A. In good order.

Q. To your knowledge do these photographic results represented in these prints accurately photographically represent the things that are shown therein?

Mr. LYON.—Objected to as leading and suggestive.

The MASTER.—The objection is overruled.

Mr. LYON.—Exception.

(Deposition of H. C. Robb.)

A. They do.

Q. (By Mr. BLAKESLEE.) Was anybody present when you took these photographs?

A. I don't remember.

Q. Do you remember the time of day you took them? A. No.

Q. What part of the twenty-four hours was it—the light hours or the dark hours?

A. The light hours.

Q. Then you took them by the actinic rays of the sun? A. Yes, sir.

Q. What did you do with the plates after you took the [492] photographs?

A. I had them developed.

Q. Where are the plates?

A. They are not taken on plates.

Q. Where are the films?

A. I don't know; in San Francisco, I guess.

Q. When did you last see them?

A. Years ago.

Q. Do you know who made the prints from the films? A. No.

Q. What did you do in that respect?

A. Had them printed in Milwaukee.

Q. Did you develop the plates? A. No.

Q. These have been in your possession ever since January, 1904? A. Yes, sir.

Q. Any alteration ever been made in them?

A. No.

Q. Were all these marks on the reverse side of these three prints put on the dates you have given?



(Deposition of H. C. Robb.)

Mr. LYON.—Objected to as leading and suggestive.

The MASTER.—The objection is sustained.

Q. (By Mr. BLAKESLEE.) When did you put these dates on these?

A. Several months after.

Q. How long would you say?

A. It might have been three months, four or five months.

Q. Were they all put on at the same time?

Mr. LYON.—Objected to as leading and suggestive.

Mr. BLAKESLEE.—I will mark the one with the pencil marks, A, B and C, and ask you when you put the marking on each one of these? [493]

A. All about the same time.

Q. How far apart?

A. I couldn't say. It is too far back to remember details.

Q. Can you state whether it was days apart or months apart?

Mr. LYON.—Objected to as leading.

The MASTER.—Sustained.

Q. (By Mr. BLAKESLEE.) Have you any recollection about it? A. No; I can't say.

Q. When, to your knowledge, did these leave Milwaukee—these photographs?

A. They have been in my possession.

Q. Where did you take them?

A. San Francisco.

Q. Did you show them to anyone there?

A. Yes, sir.

(Deposition of H. C. Robb.)

Q. To whom?

A. I can't remember. It was at the Byron Jackson Machine Works.

Q. Anyone in particular that you remember?

A. No.

Mr. BLAKESLEE.—We offer them and ask that they be marked respectively Defendant's Exhibit 7, 8, and 9, and marking the one marked A as 7.

Mr. LYON.—We object to them on the ground that no foundation is laid, incompetent, irrelevant and immaterial and not identified with this litigation.

Mr. BLAKESLEE.—We have not the pumps here and we offer this with the testimony of the witness, as being the best evidence under the circumstances, with probably a further showing [494] of that pump, in connection with other testimony.

Mr. LYON.—These photographs don't show anything of the mechanical construction.

Mr. BLAKESLEE.—To reinforce the witness' testimony, to show that a physical thing was installed there. We have had words and drawings so far and this is a showing to further represent the fact of installation, to show that there was a pump there. There is a pump head shown there.

Mr. LYON.—We object then upon the further ground that it is incompetent, no foundation laid, not the best evidence and no foundation laid for the introduction of secondary evidence. As far as the record shows, if there was any pump installed at that time, it is still in the same well.

(Deposition of H. C. Robb.)

Mr. BLAKESLEE.—We cannot bring the pump here and it is obvious that this is the best evidence that can be produced before this court at this time. Of course, if the Court will view that pump, that would be the best evidence. But at the place of trial we cannot produce any better evidence than that. It would be impossible to bring such a thing as that into the courtroom. It is a pump two hundred feet long.

The MASTER.—That is not the point about it. The photographs don't describe any particular thing.

Mr. BLAKESLEE.—We admit that, but it shows that—it visualizes the installation. It shows the belt driven top; it shows an installation. It does not follow that the photograph must show all the details of the defense. The picture of the building in which the pump was installed is corroboratory. It shows part of the thing which was installed.

The MASTER.—Take this one marked B especially. If there is anything that has to do with the pump there, I don't see it.

Mr. BLAKESLEE.—Here is the pump head. There are parts [495] of the installation. Of course, by a photograph taken now, you could not show the features that are in the well. It would be impossible. You could not show the runners. You could not show the enclosing casing except the top, and the photograph shows the top.

Mr. LYON.—I call attention to that portion of the objection which objects to it as secondary evi-

(Deposition of H. C. Robb.)

dence, for the reason that there is nothing to show that whatever, if anything, was installed at the alleged time it does not exist in the same condition to-day. I am not making that objection captiously, because, if my information is correct, very material testimony may develop from an attempt to show whether or not that installation was maintained or whether it was changed.

The MASTER.—That is one of the troubles, then. This does not fix any time.

Mr. BLAKESLEE.—It fixes the year 1904.

The MASTER.—He said he took it at the time of installation. He says these memorandums were put on months afterwards.

Mr. BLAKESLEE.—But he says he took them in January, 1904, and that date should have been January, 1904, instead of 1903.

The MASTER.—They will be admitted subject to the objection. If there has been a change, that is the best evidence of what was there at the time. They will be received subject to the objection simply, but the question of the objection is not passed upon.

Q. (By Mr. BLAKESLEE.) May I ask one further question? Please state again, or state, if you have not, what date it was on which you took these photographs? A. In January, 1904.

Mr. BLAKESLEE.—The offer goes as to the obverse and reverse side, or anything that appears. (The said photographs are [496] marked as requested, Defendant's Exhibits 7, 8 and 9, respectively.)

(Deposition of H. C. Robb.)

Cross-examination.

(By Mr. LYON.)

Q. Mr. Robb, according to your present recollection, when was it that you first went to work for the Byron Jackson Machine Works?

A. In 1888 or '89.

Q. What had you been doing just previous to going to work for the Byron Jackson Machine Works?

A. I had been working for another firm in another part of town.

Q. What firm?

A. The Simonds Saw Company.

Q. When did you leave that concern?

A. I don't remember the year or the date, but it was about that time; it was in the late eighties.

Q. In other words, the best of your recollection is that it was somewhere in the last few years of the eighties that you left that concern and went to work for the Byron Jackson Machine Works?

A. Yes, sir.

Q. You cannot tell whether it was 1887, '88, '89 or '86? A. It was not as far back as 1886.

Q. That is the best answer you can give, and as near as you can fix the date? A. Yes, sir.

Q. When you first went to work for the Byron Jackson Machine Works, what did you do?

A. Running a lathe.

Q. When did you first commence doing outside work for them in the installation of pumps? [497]

A. About two years after I went to work for them.

(Deposition of H. C. Robb.)

Q. What year would that be?

A. I have not taken time to figure it up.

Q. What is your recollection? That is what we are asking you? A. I don't know.

Q. What business were you engaged in with the Byron Jackson Machine Works in 1900?

A. Both inside and outside work.

Q. You are sure of that? A. Yes, sir.

Q. What kind of pumps were you working on for them, on outside work in 1900?

A. All sizes of pumps, horizontals and verticals.

Q. Can you give us the name of any installation that you made or worked on for the Byron Jackson Works during 1900? A. No.

Q. Can you give us the name of installation of pumps that you worked on for the Byron Jackson Works in 1901? A. No.

Q. 1902? A. No.

Q. Have you any memoranda made at the time by which you can fix a memory of the date on which you left San Francisco to go to Milwaukee on this Pabst installation? A. Yes, sir.

Q. What memorandum?

A. The memorandum consists of a memory regarding how I left the San Joaquin Valley.

Q. Then you have no written memorandum of any kind? A. No. [498]

Q. Have you any written memoranda of any kind made at the time by which you refresh your recollection as to when you returned from Milwaukee after the completion, as you say, of that installation? A. I cannot recall anything at present.

(Deposition of H. C. Robb.)

Q. Have you any means by which you can fix the date upon which you made the written entries upon the photographs Defendant's 7, 8 and 9?

A. No.

Q. To whom did you report when you first reached Milwaukee?

A. The Pabst Brewing Plant.

Q. What was the name of the party to whom you reported?

A. It was the superintendent of the Mechanical Department. I don't remember his name.

Q. Can you give us the name of anyone connected with the Pabst Brewing Company that you saw, or had business with during that installation?

A. Gustave Pabst, president of the company.

Q. Anyone else?

A. That is all the names I remember.

Q. What is the name of the mechanical engineer of the Pabst Brewing Company at that time?

A. I have tried several weeks to remember the name and I cannot remember it.

Q. He inspected and supervised that installation, didn't he?   A. Yes, sir.

Q. You don't remember his name?

A. No, sir.

Q. Can you describe him, as to what kind of a looking man he was? [499]

A. I can describe some characteristics that he had.

Q. What were they?

A. He had a habit of shrugging his shoulders, and he had a chicken ranch he was taking care of. That was his hobby outside of his line of work—

(Deposition of H. C. Robb.)

those two characteristics were very prominent.

Q. That is the best description you can give us by which we could identify him?

A. Yes, sir; I think it is.

Q. Will you describe to us the Byron Jackson Machine Shop as it existed in 1901?

Mr. BLAKESLEE.—We object to that as indefinite. It does not appear whether counsel means the structure of the buildings, its dimensions or its contents or its equipment.

The MASTER.—This cross-examination of the recollection of the witness. The objection is overruled.

Mr. BLAKESLEE.—Exception.

A. In what respect?

Q. (By Mr. LYON.) All that you can remember about it.

Mr. BLAKESLEE.—The same objection.

The MASTER.—Answer the question. Was it a nine story building or a twenty.

A. It was a two-story building, with a foundry, warehouse, a woodworking department, a pattern-shop, a blacksmith-shop on the corner of the street. If you want a description of the interior I can give you that.

Q. Is that in 1901? A. Yes, sir.

Q. Do so.

A. There were two boring-mills, a horizontal mill—

Q. Give us the size of the shop, if you can, and tell [500] us how it was arranged and how high it was, if you can, from the floor of the shop on



(Deposition of H. C. Robb.)

the first floor to the ceiling or floor of the second story.

A. The ceiling in the machine-shop was about twelve feet.

Q. What was the height of the ceiling from the floor on the second floor?

A. About fifteen feet.

Q. How large a room was the main room of the machine-shop in 1901? A. 75x150.

Q. Were there any changes made in the size of that machine-shop room or of the building itself, or of the height of the ceilings that we have referred to, during 1901, '02, '03, '04, '05 and '06?

A. No. In 1906 the fire took place and wiped it out. But there were not other improvements during that period.

Q. During all that time this shop remained the same without any changes in it?

A. No changes of any account.

Q. In the same building with the machine-shop, what other parts of the Byron Jackson Machine Works plant were there located in 1901?

A. The blacksmith-shop.

Q. How big a room was that?

A. It was part of the main building, part of the main structure. There was no partition between.

Q. Just open right through from the machine-shop into the blacksmith-shop? A. Yes, sir.

Q. Where was this shop located?

A. Sixth and Bluxome Street, San Francisco.  
[501]

Q. On which street did the shop face?

(Deposition of H. C. Robb.)

A. Both.

Q. Which side was the machine-shop?

A. Both, Sixth and Bluxome.

Q. In which direction from the machine-shop was the blacksmith-shop?

A. Facing on Bluxome Street.

Q. How did you get upstairs to the second floor of the building at that time—1901?

A. Two stairways and an elevator.

Q. Where were the stairways?

A. One off Sixth Street, and the other was an interior stairway, alongside of the elevator.

Q. Where was the elevator arranged in that building?

A. Close to the boiler, behind the engine.

Q. How far would that be from the Sixth Street entrance?     A. About seventy-five feet.

Q. And how far from the Bluxome Street line?

A. About the same distance; possibly a hundred feet, and the elevator was outside of the machine-shop proper.

Q. Did you say you saw a pump standing installed in 1901, somewhere in that shop?

A. Yes, sir.

Q. Whereabouts in the shop was it?

A. Alongside of the tank—the testing-tank.

Q. Where was the testing-tank?

A. At the foot of the stairway.

Q. Right near this interior stairway?

A. Yes, sir.

Q. How long was this pump and its drive shaft?

(Deposition of H. C. Robb.)

A. When I saw it it was laying on the floor horizontally. [502]

Q. When was it you saw it first?

A. When I came in from the San Joaquin Valley in 1903.

Q. When was it that you came in from the San Joaquin Valley in 1903? A. In October.

Q. That is the first time you saw that pump?

A. I don't know that I saw that particular pump. You asked did I see any pump.

Q. This particular pump that I now refer to that you say you saw in 1903 when you came in from the San Joaquin Valley, that was the first time you saw that particular pump, was it? A. No.

Q. When had you seen it prior to that time?

A. I cannot say.

Q. In what condition was it when you saw it prior to the time?

A. Lying on the floor in a horizontal position.

Q. What had you been doing in the San Joaquin Valley?

A. Installing pumps for the Byron Jackson Machine Works.

Q. For whom had you installed any pumps during that trip?

A. The Mount Whitney Power Company.

Q. What kind of pumps were they?

A. Vertical, in frames.

Q. Pit pumps? A. Yes, sir.

Q. Did you have any kind of talk with anybody about this pump that you have referred to before

(Deposition of H. C. Robb.)

you left in 1903 to make the installation in the San Joaquin Valley?

Mr. BLAKESLEE.—Objected to as calling for a conversation which is obviously not proper, there being no showing that any of the parties were present. [503]

The MASTER.—Answer the question yes or no.

A. No.

Q. How long before you left on this trip to Milwaukee to make this Pabst installation, was it that you had been notified or informed that you were going there? A. About sixty days.

Q. What instructions had been given you in regard to such installation before you left?

A. That it was to make the tubing and shafting in Milwaukee and finish the pump and install it and get it accepted.

Q. Who gave you those instructions?

A. Byron Jackson.

Q. How did he give you those instructions?

A. Verbally.

Q. Did he show you any of the tracings or blue-prints? A. Yes, sir.

Q. Those that you have identified in your testimony? A. Yes, sir.

Q. And it was by means of those that he explained to you the construction that was to be installed by you? A. Yes, sir.

Q. And all of the instructions you had then in regard to that installation or that character of installation at that time, were verbal by Mr. Byron Jackson in connection with the blue-prints or

(Deposition of H. C. Robb.)

tracings which you have identified?

A. Byron Jackson and Frank Jackson, superintendent of the company.

Q. They were all verbal in connection with the blue-prints or tracings which you have identified?

A. Yes, sir.

Q. No talk about any pump itself? They didn't show you [504] any pump that was erected like the one you were to erect, did they?

A. I don't remember anything of that kind.

Q. You don't remember anything about their showing you any pump at that time?

A. There was a pump and I helped test the pump that was to be installed for the Pabst well.

Q. That was the Pabst pump itself?

A. Yes, sir.

Q. No other pump? A. No.

Q. This Pabst installation was a special installation and a new one, wasn't it?

Mr. BLAKESLEE.—Objected to as calling for a conclusion as to what the witness might mean when he answers it. It does not call for a statement of facts.

The MASTER.—The objection is overruled.

A. It was new of that particular type.

Q. Just what do you mean by your last answer—that is "it was new of that particular type"?

A. It was to go in a bored well hole and it was new in that respect.

Q. In other words, that was the first bored well pump that you had installed for the Byron Jackson Machine Works? A. Yes, sir.

(Deposition of H. C. Robb.)

Q. And it was the first one that you know of that the Byron Jackson Machine Works had put out, was it?     A. Yes, sir.

Q. Who besides Frank Jackson and Byron Jackson do you remember that was connected with the Byron Jackson Machine Works in 1900?

A. I know of the men in the shop and their names and the foreman. [505]

Q. Who was the foreman?

A. A man named Filliotti.

Q. Of what was he foreman?

A. Foreman of the machine-shop.

Q. Who was foreman of the blacksmith-shop in 1900?

A. There was not any. There was only one fire.

Q. What was Mr. Frank Jackson's position at that time in 1900?     A. Superintendent.

Q. Whom else can you name that was connected with the Byron Jackson Machine Works in 1900?

A. Ralph Gibson was teamster. John Thompson, afterwards foreman; Fred Bonner was afterwards a foreman and Harry Mitchell was engineer.

Q. Is that all you remember in 1900 as to who was employed or had any connection with the Byron Jackson Machine Works, during the year 1900?

A. Mr. Boyer was manager in the office.

Q. Anyone else?

A. I could think up several other names if I have time to do it.

Q. Those are all you recall at the present time?

A. Just offhand, yes. Up to the time of the strike, yes, sir.

(Deposition of H. C. Robb.)

Q. When was the strike?     A. 1901.

Q. What time of the year?     A. May.

Q. How long did that strike last?

A. Six months.

Q. How many of these men left at the time of the strike? [506]     A. I don't know.

Q. Did you continue to work for the Byron Jackson Machine Works during that strike?

A. No; I was out.

Q. How long were you out?     A. Six months.

Q. Who was foreman of the shop when you returned after that strike?     A. John Thompson.

Q. What John Thompson was that?

A. A man that had been a journeyman and was appointed foreman.

Q. Foreman of what portion of the shop?

A. The machine-shop.

Q. Who was the general foreman?

A. There wasn't any general foreman. Frank Jackson was superintendent and John Thompson was under him.

Q. Now, let us take 1902. How many of the men that you have mentioned were with the Byron Jackson Machine Works in 1902?

A. I have nothing to recall it with.

Q. How is it that you can recall 1901 better than 1902?     A. Because of the strike.

Q. And is your memory as good as to 1900 as it was in regard to 1901 in that regard?

A. I think so; yes.

Q. Did you ever know a man there by the name of Julius Herstel?     A. No.

(Deposition of H. C. Robb.)

Q. Wasn't there a machinist by the name of Julius Herstel in the machine-shop of the Byron Jackson Machine Works in 1903? [507]

A. There might have been; I don't know.

Q. Didn't he do work on this Pabst pump?

A. I don't think so.

Q. What position did Julius W. Herstel hold with the Byron Jackson Machine Works?

A. Foreman.

Q. When?

A. I couldn't say what year.

Q. Was it in 1903?

A. I think it was earlier than that.

Q. How much earlier? A. I don't know.

Q. Wasn't he foreman in 1900?

A. I couldn't say the date.

Q. Wasn't he foreman in 1901?

A. I couldn't say the date of that. Just a minute. He was.

Q. Was he foreman in 1899? A. I can't say.

Q. Did you ever meet a man by the name of Palsmaier connected with the Byron Jackson Machine Works? A. Yes, sir.

Q. What was his position?

A. Salesman at that time.

Q. At what time?

A. At the time you speak of, in 1900 and 1901.

Q. And 1902? A. About that time.

Q. When was it you first met Mr. Palsmaier, according to your best recollection?

A. I should say it was along in 1904 or '05. [508]



(Deposition of H. C. Robb.)

Q. Can you state positively that he was not the salesman who made the San Joaquin sale and was up there at the time you made the installation?

A. Yes, sir; he was not.

Q. Who was the shop foreman following Mr. Cuthbertson?     A. Filliotti.

Q. Who followed Mr. Filliotti?

A. Fred Bonner.

Q. How long did Fred Bonner remain foreman?

A. More than a year, but how much more I don't know.

Q. When did he become foreman?

A. I can't state the year.

Q. During what time was Mr. Filliotti foreman?

A. I couldn't state the year either.

Q. Who followed Mr. Bonner as foreman?

A. John Thompson.

Q. When did he became foreman?

A. I don't know the year.

Q. You are talking now about foreman of the machine-shop, are you?     A. Yes, sir.

Q. Who succeeded Bonner?

A. John Thompson.

Q. Who succeeded Thompson?

A. He was foreman up to the time I left.

Q. And when did you leave?

A. Twelve years ago.

Q. That would be 1908?     A. Yes, sir.

Q. What time in 1908?     A. January. [509]

Q. You have named all of the foremen of that Byron Jackson Machine Works that you can now recollect, have you?     A. Yes, sir.

(Deposition of H. C. Robb.)

Q. From the time you went there until you left in 1908? A. Yes, sir.

Q. Let me suggest another name to you. Do you know a man by the name of Yeatman?

A. Yes, sir.

Q. He was shop foreman there for awhile, wasn't he? A. No.

Q. What position was he in? A. Salesman.

Q. He was not a shop foreman at any time?

A. No.

Q. Are you sure Mr. Yeatman did not succeed Mr. Cuthbertson as shop foreman of the Byron Jackson Machine Works?

Mr. BLAKESLEE.—We object. He says he never was at any time.

The MASTER.—Go on with the cross-examination.

Q. (By Mr. LYON.) Do you know where Mr. Yeatman is now?

A. Not positively, only by reputation.

Q. What is your best information?

A. At The United Iron Works.

Q. At Oakland, California? A. Yes, sir.

Q. How long since you have seen him?

A. Eight years or more.

Q. Gustave Pabst is the only man you can name that you saw while you were East on this Pabst installation? A. And Andrew Kopperrude.

Q. Anyone else? [510]

A. That is all the names I can recall.

Q. You don't know the name of any man who had supervision of such installation, over you or whose

(Deposition of H. C. Robb.)

business it was to approve such installation?

A. It was only the manager, and I don't recall his name.

Q. You mean the manager of the Pabst Company?

A. Yes, sir; the manager of the mechanical department.

Q. You made an affidavit in this case at the request of Mr. Montgomery, one of the defendant's attorneys, did you?    A. Yes.

Q. From whom did you secure the blue-prints which was attached to that affidavit?

A. I don't remember the blue-prints at all.

Q. Is that a blue-print of one of the prints or one of the tracings that you have identified here in your testimony?    A. I don't know. I don't recall it.

Q. You don't know who placed that blue-print before you that is attached to your affidavit?

A. No.

Q. Did you talk with Mr. Keating in November of this year in regard to this Pabst installation?

A. No; I never met him.

Q. I mean 1919?    A. No; I never met him.

Q. Whom else did you talk with in regard to this matter besides Mr. Montgomery?

A. Frank Jackson.

Q. Anybody else?    A. Only with counsel.

Q. Anyone else?    A. I think not. [511]

Q. You have been over these blue-prints and tracings more than once before giving your testimony here, have you not?    A. No.

Q. Then the blue-print attached to your affidavit

(Deposition of H. C. Robb.)

was the only blue-print that was shown you before you gave your testimony here?

A. I don't recall it at all, that I had seen any blue-print in connection with the affidavit.

Q. What do you recall having seen in the line of blue-prints or tracings while talking with Mr. Montgomery, Mr. Frank Jackson or Mr. Jackson before giving your testimony?

A. I didn't see any blue-prints.

Q. Or any tracings? A. No, sir.

Q. Did you not see any blue-prints at all while talking with any of these men?

A. Only Mr. Frank Jackson.

Q. Those were the only blue-prints you saw?

A. Yes, sir.

Q. What prints were those?

A. Of that plant.

Q. You have no recollection whatever of having made an affidavit in this case on December 17, 1919?

A. Yes, sir.

Q. Was there a blue-print attached to that affidavit?

A. I don't recall at this time that there was.

Q. Prior to making that affidavit you had talked with Mr. Frank Jackson, had you? A. Yes, sir.

Q. What tracings or blue-prints had you and he looked at before making that affidavit? [512]

A. Not any.

Q. None whatever? A. No.

Mr. LYON.—In connection with the cross-examination of the witness, I offer in evidence the affidavit of the witness made in this case and sworn to

(Deposition of H. C. Robb.)

on December 17, 1919, before Charles C. Montgomery, a notary public in and for Los Angeles County, State of California, and the blue-print attached thereto.

Q. I show you a print which is attached to your said affidavit. You talked that print over with Frank Jackson, had you, before you made that affidavit?

A. At this time I have no distinct recollection that I did.

Q. Did you or did you not talk it over?

A. I don't know; I have no recollection at this time of having done so.

Q. You have no recollection at this time that the print was even attached to the affidavit? Is that correct?

A. That is correct.

Q. Did you have anything to do with the Schlitz Brewing Company installation?

A. No.

Q. And except as you casually saw something being made in the Byron Jackson Machine Works you know nothing about a Schlitz Brewing Company installation?

A. I got the order for it.

Q. When?

A. In 1904.

Q. What time in 1904?

A. April.

Q. Was it of the same identical construction as you [513] installed for the Pabst Brewing Company?

A. No; it was a smaller capacity.

Q. Any other changes in it?

A. I think not.

Q. How many stage pump was it?

A. Three.

Q. How many pumps?

A. One.

Q. You say that the only trouble you had with this Pabst installation while you were there was

(Deposition of H. C. Robb.)

with the oil device. Please tell us what that trouble was and what you did. Describe it in detail.

A. The oil was found to be an objection to the cleansing of the kegs and we substituted water for oil.

Q. How did they substitute water for oil?

A. Put water through the same channels that the oil formerly took.

Q. Describe that, please.

A. There was a can containing oil under first conditions and the oil can was emptied and water-pipes took the place of it. The water was first run through a settling chamber to exclude any foreign substance that might be in the water.

Q. You say you brought back the payment for this Pabst installation with you?

A. The last payment.

Q. How much was that last payment?

A. I don't remember the amount. It was more than \$500.00.

Q. Was it a thousand dollars?

A. I don't think it was. It was between \$500.00 and \$1,000.00.

Q. How much was the total contract? [514]

A. I don't remember.

Q. How much had been paid previous to that last payment? A. I don't know that, either.

Q. All you remember, then, is that you brought home some payment. Isn't that true?

A. The truth is that the last payment was brought home by me and amounted to between \$500.00 and \$1,000.00.

(Deposition of H. C. Robb.)

Q. You have a definite recollection that it was over \$500.00? A. Yes, sir.

Q. And a definite recollection that it was under \$1,000.00? A. Yes, sir.

Q. In what form was that brought back by you—by bank draft or the personal check of the Pabst Brewing Company, or how?

A. It was a check signed by the president of the Pabst Company, Gustave Pabst.

Q. And drawn to the Byron Jackson Machine Works? A. Yes, sir.

Q. Did you take part in any other installation for the Pabst Brewing Company besides the first one you mentioned in your testimony? A. No.

Q. Did you go back there and install any other pumps? A. No.

Q. Did you make the installation of the pumps for the Schlitz Brewing Company? A. No.

Q. Did you have anything to do with it? A. No.

Q. Then, you were in error in your testimony when you stated that you installed the pumps for the Schlitz Brewing Company? [515] I call your attention to the following questions and answers: "Q. Do you remember the names of any persons or parties for whom the enclosed shaft pumps were built for the Byron Jackson Machine Works after you returned from Milwaukee? A. I can state those that I installed pumps for. Q. State it. A. The Lagrange Service Company, the Schlitz Brewing Company at Milwaukee, the Southern Pacific Company in Santa Clara County, California, the Santa Fe Railroad at Richmond."

(Deposition of H. C. Robb.)

Q. You will correct that and say that you had nothing to do with the Schlitz installation?

A. Yes, sir.

Q. Did you have to do with the Lagrange Service Company installation?     A. Yes, sir.

Q. What year was that?     A. 1905 and '06.

Q. What time in 1905?

A. I don't remember the month.

Q. Did you have to do with the installation for the Southern Pacific Company at Santa Clara County?     A. Yes, sir.

Q. What time of the year was that?

A. I don't remember.

Q. What year was it when the Santa Fe Railroad installation was put in at Richmond?

A. I couldn't tell you that, either. It was about 1907.

Q. You say that when you returned from Milwaukee you saw a pump on the floor of the shop and that you were given the upper part of the frame to make other tests with, but not the pump itself?

A. No; that was when I returned from the San Joaquin [516] Valley.

Q. What year?     A. 1902.

Q. How do you fix that date?

A. Because I was in the San Joaquin Valley on several occasions and there was trouble with the oil bowls, and that was what I was working on.

Q. Was that the same trip that you have last referred to on your cross-examination this morning?

A. No.

Q. That is another trip, is it?     A. Yes, sir.



(Deposition of H. C. Robb.)

Q. How many times did you make trips to the San Joaquin Valley on installations during 1902 and '03? A. Three or four.

Q. Not more than that?

A. I think that is about all.

Q. When did you make those trips?

A. At different seasons of the year.

Q. Your recollection does not enable you to fix those definitely, one way or the other, does it?

A. No.

Q. This pump that you saw was on the floor, lying on its side, I think you said? A. Yes, sir.

Q. How long did it remain lying there on the floor to your knowledge?

A. I saw it several times as I came in and out of the shop on trips.

Q. Did you ever see it anywhere else than lying on its side in the shop? [517]

A. No.

Q. Referring to this pump that you say you installed for the Pabst Brewing Company, Mr. Robb, you referred to a stuffing-box at the top of the pump head. Please explain to us how you assembled that stuffing-box on that pump and what you did with it in that installation?

A. It was to confine the water to the annular space between the tube and the inside of the column.

Q. What did you do with the stuffing-box? Was it loose or screwed down tight?

A. It was filled with packing and held by three studs and glands. (The question is read.)

A. It was screwed down with the studs or nuts.

(Deposition of H. C. Robb.)

Q. You have been referring to the stuffing-box at the top, have you not?     A. Yes, sir.

Q. Below that was there any other stuffing-box?

A. Yes, sir.

Q. Where was that next stuffing-box?

A. At the head of the pump.

Q. Now that one?

A. It was screwed down an internal thread in the casing.

Q. And that was a tight stuffing-box?

A. Yes, sir; with a screw.

Q. How tight did you screw that particular stuffing-box down?

A. Tight enough to hold the packing in.

Q. Did you bind the shaft at all?     A. No.

Q. The shaft was free to turn through that stuffing-box?     A. Yes, sir. [518]

Q. It was just about as free as through a brass bearing—the shaft was—through that particular stuffing-box, that you had assembled?

A. It would be a little tighter than a free box.

Q. And after the pump would run a few weeks it would be practically as free as a free box?

A. Yes, sir.

Q. During any of the time that you were at Milwaukee was the pump pulled in that well?

A. Yes, sir.

Q. How many times?     A. One.

Q. For what purpose?

A. To repair a broken shaft.

Q. What was the occasion of the broken shaft?

A. It just broke.

(Deposition of H. C. Robb.)

Q. Wasn't that due to the shaft being somewhat out of alignment, or at least, isn't that what you thought at the time?

A. Not that I have any recollection of giving any reason for it.

Q. You don't recollect giving any reason for it? That was the driving shaft of the pump, and it broke and you had to pull the installation out, and what did you do?

A. Replaced the broken shaft with a new one.

Q. Where did it break?

A. About seventy-five feet from the surface.

Q. What kind of bearings then did this drive shaft of this Pabst pump installation have, as you installed it?

A. The cast-iron container contained babbitt. The spider was a babbitted lining.

Q. Did you babbitt the box? [519]

A. No; they were babbitted in San Francisco.

Q. Was the babbitt pinned in in the bearings?

A. No; poured in a bored hole.

Q. The walls of that hole were rough, so that they would hold the babbitt, were they? A. Yes, sir.

Q. Now, Mr. Robb, when you substituted water for oil in this Pabst installation, did you make any changes at all in the pump mechanism?

A. No—yes.

Q. What.

A. A jam-nut on the gland at the bottom.

Q. What did you do with that?

A. A jam-nut on the gland at the bottom of the pump.

(Deposition of H. C. Robb.)

Q. You pulled the pump out again?

A. No; that was at that time when the shaft was repaired.

Q. What change did that effect?

A. It held the gland so it could not get loose.

Q. What gland do you refer to?

A. The one at the top of the pump casing.

Q. That was down in the well?

A. Yes; two hundred feet from the surface.

Q. What change did that effect in the operation at all?

A. None, only to keep the gland from getting loose.

Q. Then you found that the gland was loose when you pulled the pump, did you?     A. Yes, sir.

Q. What is your recollection with regard to the stand of water in this Pabst well? How high up was the water level before you started the pump?

A. One hundred feet. [520]

Q. How far did the level of the water fall when the pump went into operation and use after that?

A. Two hundred feet.

Q. It fell down below the top of the first stage of the pump?     A. Yes, sir.

Q. How do you know that?

A. By means we used to determine the level.

Q. What means were those?

A. That is for others to answer, unless I am compelled to answer I don't care to do it.

Q. Do you mean you don't know?

A. I do know.

Q. Does it involve your invention?

(Deposition of H. C. Robb.)

A. It is what is known in the trade as a technical secret, developed by years of practice, and we don't care to give it up.

Q. Whose property is that secret?

A. The Byron Jackson Machine Works and those who were using it at that time.

Q. (By the MASTER.) Were other people using it at the same time? A. I don't know.

Q. Have they used it since? A. I have; yes.

Q. (By Mr. BLAKESLEE.) Was it in general use in pump installations? A. I don't think so.

Q. Are you using that method to-day?

A. Yes, sir.

Mr. LYON.—That question may become a material one. I think we are entitled to know, so that the Master may determine [521] hereafter the weight of the testimony of the witness, by what means they determined that level.

Mr. BLAKESLEE.—We don't think it is material.

Mr. LYON.—We have not any knowledge of any trade secret to which the witness refers and we are not searching for that. We are only testing this witness as to this installation.

Mr. BLAKESLEE.—We don't think it is material to the issues of this case what the water level was after the pumping operations.

The MASTER.—Anything that took place at that time is material. It reduced the water level. How they did it or what they did, and whether it was just a chance or not.

Mr. BLAKESLEE.—It seems to me, beyond the

(Deposition of H. C. Robb.)

fact that the pump delivered water, there would be no materiality in the level of the water during the pumping operations, and we object to the question on that ground. The water must be supplied to the bowls or it could not be delivered at the top.

Mr. LYON.—That has all to do with this enclosed line shaft feature and has become material in every one of these cases before and it is liable to be in this case, and for that reason I would like to have the witness answer the question as to what means they used to determine the drop of the level of the water, due to the action of the pump, so that we may be able to ascertain what value is to be attached to his testimony in that regard.

Mr. BLAKESLEE.—The Getty decision, as we understand it, has limited the patent in the respect urged here, to the nature of the seal at the bottom of the enclosing casing, but we do not see that that makes this question material.

The MASTER.—I can't think of any reason why something that has been in operation for twenty years is not to be talked about, and it does seem to me that it is part of the things the [522] plaintiff is entitled to know.

Mr. BLAKESLEE.—Ordinarily a witness is protected from divulging a trade secret which may be of value in his business or that of his employer's.

The MASTER.—They have never claimed it in the Byron Jackson case before. There was nothing said about reducing the water levels except by a pump.

Mr. MONTGOMERY.—What difference does it

(Deposition of H. C. Robb.)

make how they determine the drop of the level?

The MASTER.—It is where they did it as well, as determining it.

Mr. MONTGOMERY.—As I understand it, what means did they have to determine the water level.

The MASTER.—That is just the same thing.

Mr. MONTGOMERY.—I cannot see the materiality of the water level at all, if the pump delivered water.

Mr. BLAKESLEE.—As long as the water found its way through the bowls, so that it could be elevated, that is all that is material.

The MASTER.—It becomes material only as part of the transaction at the time. I don't care how many pumps they have now, reducing the water level, or what means they have for reducing the water level, but I do think that what they seek to know is material as part of the very things he is testifying about.

Mr. MONTGOMERY.—I don't think they should be allowed to use the process of the court to elicit trade secrets unless they show very distinctly what the materiality is. I can't see any materiality, but that may be due to my ignorance of the construction here.

Mr. BLAKESLEE.—One of the troubles in this case is that counsel has never vouchsafed an opening statement to guide your [523] Honor or any of us as to what he contends.

The MASTER.—I suppose he is meeting the defense you rely upon. We want all the facts.

Mr. BLAKESLEE.—There has been no opening

(Deposition of H. C. Robb.)

statement made to guide us and I don't know what counsel contends in this respect. It seems to me the materiality of this is much lighter in the scale than the witness' desire to maintain his trade secret. Of course we, as attorneys for defendants in the case, don't care. It is only for the protection of the witness in his proper relation with his own affairs. From our viewpoint we make no objection to the evidence.

The MASTER.—Didn't everybody in the Pabst Brewing Company see this experiment?

A. The manager of the mechanical department.

Q. He saw what was done? A. Yes.

Mr. LYON.—It could not be much of a trade secret if the supervising engineer saw everything that was done there.

Q. (By Mr. BLAKESLEE.) Was it your secret at the time and did you use it as your secret knowledge?

A. No; it was on instructions of the Byron Jackson Machine Works.

Q. Did you enjoin the mechanical man of the Pabst plant to retain it as a secret? A. No, sir.

Mr. BLAKESLEE.—We will have to pass it up to your Honor.

Mr. LYON.—The witness says himself there was injunction of secrecy at that time.

The MASTER.—And the engineer in charge of the works knew about it. I don't think it is a secret. The witness will answer the question. [524]

(Question is read by the reporter.)

A. With a 1/4-inch pipe that was let into the well.



(Deposition of H. C. Robb.)

Q. (By Mr. LYON.) How did you use such  $\frac{1}{4}$ -inch pipe with which you measured the level of the standing water in the well?

A. By the pressure on it.

Q. Air pressure? A. Yes, sir.

Q. How did you by such means indicate the water level? Explain that to us.

A. It was done to satisfy the mechanical engineer and was accepted.

Q. I ask you how it was done and not for your conclusion.

A. I ask the protection of the court.

The MASTER.—I have said that I did not see that you needed any protection. The objection is overruled.

Mr. MONTGOMERY.—Might not that be deferred until this afternoon and let us see what the thing is and what they are driving at?

Mr. LYON.—There is another thing. I don't believe the man can explain it.

The MASTER.—What did you do at Milwaukee to test that well and the water level?

A. We measured the water level by means of a  $\frac{1}{4}$ -inch pipe and an air pipe. That was manipulated by myself and the mechanical engineer, and the pump was accepted upon that test.

Q. (By Mr. LYON.) How did you manipulate this air pressure in the  $\frac{1}{4}$ -inch pipe to indicate that water level? Explain in detail what you did at that time.

The MASTER.—What you did at Milwaukee is what I am getting you to tell. [525]

(Deposition of H. C. Robb.)

A. We put a pressure gauge on the air line and pumped air pressure into it and noticed the amount that the gauge indicated.

Q. Well, Mr. Robb, tell us just what your water level indications were in that well after this test? First, what did it show the water level to be before the pump was started, and then what was the water level after the pump had been in operation, say for twenty-four hours?

A. One hundred feet when the pump was standing, and two hundred feet when it was running.

Q. The portions of the pump were out of water or above the water level when the water level had so fallen to two hundred feet?

A. The bottom bowls were practically level with the water.

Q. The bottom bowls were practically level with the water?     A. Yes, sir.

Q. How many bowls then were out of the water?

A. Three.

Q. You frequently stopped and started that pump when you were installing it and before it was accepted?     A. Yes, sir.

Q. Approximately how many times?

A. Probably a dozen.

Q. You didn't put in all your time while you were with the Byron Jackson Machine Works in 1900, '01, '02 and '03, outside of the shop putting in installations, did you?     A. No, sir.

Q. What did you do while you were in the shop?

A. Ran a machine or worked on the floor.

Q. In other words, you were working as a machin-

(Deposition of H. C. Robb.)

ist [526] in the shop? A. Yes, sir.

Q. And doing what any of the rest of the machinists or anybody called upon you to do?

A. Only the foreman.

Q. That is what I mean. But you were working as a regular machinist, doing anything or everything that was to be done? A. Yes.

Q. Then your job while you were in the machine-shop was that, practically, of a handy man in the shop? A. No; as a journeyman machinist.

Q. Then you were not a specialist in the shop upon any particular machine tools?

A. No; I was what they called an all-around man.

Q. The shaft casing of this Pabst pump was made in Milwaukee?

A. The machine work was done in Milwaukee.

Q. At what shop? A. Andrew Kopperrood.

Q. Under whose instructions? A. Mine.

Q. Anybody's else? A. No.

Q. No one else either on behalf of the Pabst Brewing Company or of the Byron Jackson Machine Works? A. No.

Q. You had sole charge of it? A. Yes, sir.

Q. You have given us now the name of every person that you can recollect who had anything to do with this Pabst installation, or the supervision of it or acceptance of it, have you? [527]

A. Byron Jackson saw the tubing and shafting before it was ready to assemble.

Q. I understand the names you have already named. But my question is, there is nobody else that you have not named heretofore that you can

(Deposition of H. C. Robb.)

name that either had anything to do with the making or installation or acceptance of the installation or its inspection, or anything of that kind?

A. No.

Q. How long after you got this pump fully installed for the Pabst Brewing Company, was it before you left Milwaukee?

A. I started the pump the first week in January and I left in April.

Q. What time in January, according to your recollection, was it that you say they started the pump? A. The first week.

Q. That was in continuous operation from then on till April?

A. With the exception of the time of making the repairs, yes.

Q. How much time was spent in making repairs?

A. About two weeks.

Q. When were these repairs made?

A. I don't recall just the time.

Q. Were they made in January, February, March or April? A. I think in January.

Q. When was it that you quit using oil and commenced using water as a lubricant?

A. About three weeks after we started.

Q. In other words, that would be the latter part of January, 1904? A. Yes. [528]

Q. What other repairs did you have to make on that pump besides pulling this pump once, as you have told us about in your cross-examination here this morning?

A. We found the setscrews that were holding the

(Deposition of H. C. Robb.)

spiders had no jam-nuts to hold them, and we took the setscrews off and put on screws with jam-nuts.

Q. In other words, the setscrews would not stay in place, and the alignment would not stand?

A. No; they were a loose fit in the casing.

Q. And the result of that was that the shaft and casing did not stay aligned truly?

A. I couldn't say that.

Q. Didn't the enclosing casing break in two as the result of being out of alignment?     A. No.

Q. Not at all?     A. No, sir.

Q. How many times did you pull out that pump on account of these setscrews?

A. They were made at the time the shaft was repaired. All the repairs that I speak of were made at that time.

Q. You only pulled the pump once during all the time you were there?     A. Yes, sir.

Q. Is it a fact that when you pulled this pump that one time you found the joints of the casing loose, and had to tighten them up?

A. The casing was not loose and the tube was not loose.

Mr. LYON.—Take the witness. [529]

Redirect Examination.

(By Mr. BLAKESLEE.)

Q. What was the result of putting these jam-nuts on the stuffing-box at the lower end of the shaft of the Pabst installation?

A. The object was to keep the packing in more securely than it was with the possibility of a loose gland.

Q. Why was that a desirable object?

(Deposition of H. C. Robb.)

A. To keep the water from leaving the pump and directing it into its proper channel.

Q. What kind of a fit did it make or secure as between the packing and the shaft on that stuffing box?

A. It made a neat running fit and the gland helped support the shaft.

Q. What kind of a fit with reference to tightness?

A. It kept the water from entering the tube?

Q. Which tube?

A. The tube containing the shaft.

Q. How was it that the first Pabst pump was tested out at San Francisco before it was shipped to Milwaukee?

A. It was laid on its side horizontally. The water was tested by checking it under a pressure gauge. The thrust of the pump was determined carefully by a spring-measuring apparatus—a spring scale.

Q. How was the pump rotated in making the test?

A. It was either a steam engine or an electric motor, I don't remember which.

Q. How was that source of power connected up with the runners? A. With a belt.

Q. What was the belt applied to?

A. An auxiliary shaft was supported independent of the pump. [530]

Q. What did that shaft connect with?

A. The pump shaft.

Q. What was this pump shaft used in that test?

A. A short piece projecting outside of the shafting as shown by the blue-prints.

Q. Projecting outside of what?

A. The casing of the pump shell.

(Deposition of H. C. Robb.)

Q. Do you remember anything further about that test?

A. The power was so determined and the amount of water, and the elevation and the thrust.

Q. Who was present at that test?

A. Mr. Frank Jackson and myself and one or two helpers.

Q. Did you install any other kind of pump, of any kind in the same locality or in the same part of the country as the place at which you installed the Lagrange pump?

A. Yes, sir; there was one for the same company at Blue Island.

Q. How far was that from Lagrange?

A. About fifteen miles in a direct line.

Q. When did you install that?      A. In 1905.

Q. What kind of a pump was that? Describe it briefly.

A. A bored well pump of the type of the Schlitz, and connected direct with the motor.

Q. Type of what?

A. Of the Pabst, and directly connected to the motor.

Q. Who supplied that pump outfit?

A. The Byron Jackson Machine Works.

Q. Under whose instructions did you install that outfit?      A. The Byron Jackson Machine Works.  
[531]

Q. Now, in this other pump that you have just told us about, that you installed in 1905 near the Lagrange installation, what, if anything, was used for lubrication in that pump?      A. Oil.

(Deposition of H. C. Robb.)

Q. How was that supplied?

A. The oil for the pump bearings was forced downward by water pressure.

Q. How was that pressure applied?

A. It was applied to the oil cups the same as a cup on a steam engine. A steam engine lubricating oil cup.

Q. Was there any other installation provided for in that pump—any other lubrication installation?

A. The lubrication of the tubing.

Q. How was that provided?

A. The same as the Pabst.

Q. Referring again to this stuffing-box at the lower end of the shaft in the Pabst installation, how did that compare with other stuffing-boxes used in pumps at that time, with respect to tightness and fit, respectively?

A. It was the same. It was the same running fit that is used in ordinary pumps.

Q. How did it compare with the tightness and fit of the stuffing-boxes in pumps used to-day?

A. The same.

Mr. BLAKESLEE.—That is all.

Mr. LYON.—That is all.

The MASTER.—The witness is excused. [532]



In the Southern Division of the United States District Court, for the Northern District of California, Second Division.

IN EQUITY—No. 485.

FOR INFRINGEMENT OF LETTERS  
PATENT #821,653.

LAYNE & BOWLER CORPORATION (a Corporation),

Plaintiff,

vs.

WESTERN WELL WORKS, INC. (a Corporation), ROTARY DRILLING & DEVELOPMENT COMPANY (a Corporation), STANLEY M. HALSTEAD, P. E. VAUGHAN and ALLEN W. ROSS,

Defendants.

**Certificate of Official Reporter to Transcript of  
Record Made Pursuant to Stipulation.**

I, I. Benjamin, official reporter, having, pursuant to order of Court, taken down the testimony of the witnesses Franklyn H. Jackson and H. C. Robb in the above-entitled cause, at Los Angeles, California, on the 5th day of January, 1920, et seq., do hereby certify the above and foregoing to be a full, true and correct transcript of the record of the testimony of the said Franklyn H. Jackson and H. C. Robb in the said case of Layne & Bowler Corporation, Complainants, vs. American Well & Prospecting Co. et al., Defendants, In Equity—No. E-42.

Dated: Los Angeles California, July 31, 1920.

I. BENJAMIN,

Official Reporter. [533]

(Here follows blue-print attached to deposition of Frank H. Jackson and R. C. Robb.)

Received copy of within record this 11th day of August, 1920.

FREDERICK S. LYON,

Atty. for Plaintiff.

[Endorsed]: Filed Sept. 7, 1920. Walter B. Maling, Clerk. [534]

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In the Southern Division of the United States District Court, in and for the Northern District of California, Second Division.

Before Hon. FRANK S. DIETRICH, Judge.

No. 485—IN EQUITY.

LAYNE & BOWLER CORPORATION,

Plaintiff,

vs.

WESTERN WELL WORKS, INC. (a Corporation), ROTARY DRILLING & DEVELOPMENT COMPANY (a Corporation), STANLEY H. HALSTEAD, P. E. VAUGHAN, and ALLEN W. ROSS,

Defendants.

**Proceedings Had September 2, 1920.**

Thursday, September 2, 1920.

Counsel Appearing:

For the Plaintiff: FREDERICK S. LYON, Esq.,  
and WILLIAM K. WHITE, Esq.

For the Defendants: CHARLES E. TOWNSEND,  
Esq., and W. A. LOFTUS, Esq.

(It is stipulated that a transcript shall be written up in triplicate, and each party pay one-half the same, to be taxed as costs in favor of the prevailing party.) [535]

OPENING STATEMENTS OF COUNSEL  
OMITTED. [536]

Mr. LYON.—I understand, Mr. Townsend, that it is stipulated that the title to the patent in suit is in the plaintiff, as alleged in the bill of complaint.

Mr. TOWNSEND.—We have no reason to question the pleadings in that respect.

Mr. LYON.—I think we can expedite the trial of this case very much if we adjourn now till morning, and give me an opportunity to get the necessary exhibits up here, and then I will produce a witness in the morning and proceed.

(An adjournment was here taken until tomorrow, Friday, September 3, 1920, at ten o'clock A. M.) [537]

In the Southern Division of the United States District Court, for the Northern District of California, Second Division.

Before Hon. FRANK S. DIETRICH, Judge.

No. 485—IN EQUITY.

LAYNE & BOWLER CORPORATION,

Plaintiff,

vs.

WESTERN WELL WORKS, INC., et al.,

Defendants.

Friday, September 2, 1920.

**Reporter's Transcript.**

In the Southern Division of the United States District Court, in and for the Northern District of California, Second Division.

Before Hon. FRANK S. DIETRICH, Judge.

No. 485—IN EQUITY.

LAYNE & BOWLER CORPORATION,

Plaintiff,

vs.

WESTERN WELL WORKS, INC. (a Corporation), ROTARY DRILLING & DEVELOPMENT COMPANY (a Corporation), STANLEY H. HALSTEAD, P. E. VAUGHAN, and ALLEN W. ROSS,

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Friday, September 2, 1920.

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For the Plaintiff: FREDERICK S. LYON, Esq.,  
and WILLIAM K. WHITE, Esq.

For Defendants: CHARLES E. TOWNSEND,  
Esq., and W. A. LOFTUS, Esq.

**Testimony of M. E. Layne, for Plaintiff.**

M. E. LAYNE, called for the plaintiff, sworn.

Mr. LYON.—Q. Where do you reside, Mr. Layne?

A. South Pasadena, California.

Q. Prior to moving to California, had you at any time lived in Houston, Texas? A. Yes.

Q. You are the M. E. Layne to whom letters patent No. 821,653, the patent in suit, were issued?

A. Yes.

Mr. LYON.—We offer the patent in suit in evidence, and ask that it be marked "Plaintiff's Exhibit 1," [539] (The patent was marked "Plaintiff's Exhibit 1.")

Q. Prior to moving to Texas, Mr. Layne, in what business and where had you been engaged in such business?

A. In the well business, and I commenced to work in the spring of 1883 in South Dakota, and moved from there into Iowa, later, and continued the well work in Iowa, throughout Minnesota, and Nebraska and Dakota until the year of 1902; I did some work in 1902 and 1903 in those states, but also did work in 1902 and 1903 in Texas, moving to Texas, as I now recall it, with my family temporarily in the winter of 1902-3, and permanently in 1904, as I now recall it. I may be slightly in error in the

(Testimony of M. E. Layne.)

date that I moved there permanently.

Q. You say you were engaged in South Dakota and Iowa in well work. Please explain to the Court a little more fully what you mean by well work in that connection?

A. In Dakota my principal work was for ranchers, although I did some city and municipal work; also, some work for public utilities; the greater part of my work being what we call for farmers or ranchers in the tubular well line—some work of a large size, but mostly 2 and 3-inch wells, especially the wells that were of any particular depth, or any very great depth; I did a good amount of 24 and 34-inch work, which was in the ordinary bored well type, not drilled.

Q. After you moved to the State of Texas, in what business did you engage?

A. Well, I moved from there into Iowa and in Iowa I was in the public utility well construction and city well construction, also railroad work, almost exclusively. Those wells were large ranging from 6 inches to 16-inch drilled wells.

Q. Now, then, Mr. Layne, explain to the Court what you mean [540] by the work in that connection; what did you do in that connection, and how did you drill those wells, in a general way?

A. The wells drilled in Dakota were drilled by what we call the jet system, or drop system, using water for elevating the dirt, and the wells that we bored in Dakota we used the machine that simply bored or that cut dirt loose and the dirt was removed from the well on the tool that cut it; the

(Testimony of M. E. Layne.)

boring rods and cutting tool were removed from the well each time we had the auger or cutting member filled with clay or other substance being penetrated.

The next system that I spoke of, the wells drilled in Iowa, and Minnesota, and South Dakota, and throughout that part of the country for public utility and railroad work, at that time we were using mostly what we call solid tools; by this method we put the drill in, we cut the dirt loose with a drop tool, and after a sufficient amount of drilling done so as to get the water well laden with the cutting for boring the well, we would withdraw the drill stem and lower what we call the slush bucket into the well, remove the boring, and then after the bore of the well had been cleaned we would insert the drill again and cut more of the formation loose, and remove the same with a slush bucket, as before stated. In the sand and more loamy districts we used what is called the rotary system, that is commonly used in all loamy or sandy shale formations and sand formations.

Q. In those wells that you so drilled in South Dakota and Iowa before you moved to Texas, what kind of pumping mechanism did you install, if any?

A. Usually, we installed what was called a reciprocating type of pump, with steam head or power driven, but in most cases steam heads for the public utility work and city work. [541]

Q. When you moved to Texas, did you have anything to do there with the drilling of water wells?

A. Yes.

(Testimony of M. E. Layne.)

Q. Briefly explain to the Court what you first did in that line, and what the general construction and mode of operation of the pump mechanism was in such wells?

A. In Texas, where I was working, the rice industry demanded a large amount of water, for which purpose and supply they were using drilled wells, and they used the rotary system, mostly, in the drilling of those wells, and the pump mechanism used for procuring the water from the well was what is commonly known as the open-pit or vertical centrifugal pumping type pump. The pump was installed in an open pit, similar to that of a shaft in a mine. They had to dig the pit large enough so as to admit of men going up and down the pit to prepare for the pump, also for the installation of the pump, the adjustment and the lubrication of the same. One of the difficulties encountered in this class of pump construction was the fact that in many instances we encountered sand and water at a shallower depth than the permanent well could be secured at. For instance, at 28 to 35 feet we would in many cases encounter a quicksand or fine sand formation carrying considerable water, but not sufficient water to supply the demand of the well or demand of the party using the water; consequently, the bore of the well was carried to a greater depth, at which we usually secured thicker stratas of sand, and of a coarser nature. In many cases mixed with gravel, and in some cases as much as 50 to 100 feet of this water-bearing formation was encountered in one strata. Before, the well in that case was  $95\frac{5}{8}$



(Testimony of M. E. Layne.)

or 10-inch, and in some cases 11 $\frac{5}{8}$  and 12-inch. At the point at which the [542] water was secured, we put in screens opposite the waterbearing formation, so that the water might enter the bore of the well from the different strata encountered. Many times we encountered two or three strata, and in those cases we set the casing so that the casing that did not contain screens came opposite the nonbearing portion of the well, and the screen portion of the casing was placed opposite the water-bearing portions of the well. In order that these pumps might be placed low enough so that they would be within reach of the water produced by the deepest strata, it was necessary to sink an open pit to a greater depth, in many cases, than the clay formation overlying the first strata, and, therefore, it became a very difficult matter to install the pit to a depth great enough to permit the placing of the pump at low enough a point so that the pump would be well within the reach of the water from the deeper strata. This was actually experienced by me in attempting to place a pump in a well on the Milner—

The COURT.—I think he has gone far enough.

Mr. LYON.—Q. Now, Mr. Layne, I show you a print and ask you if that, in a general way, represents the installation of a pump in one of those pits—one of those pump installations to which you have referred? A. Yes.

Q. You have seen this print before? A. Yes.

Q. Made under your instructions? A. Yes.

Mr. LYON.—We will ask that this be received in

(Testimony of M. E. Layne.)

evidence and marked "Plaintiff's Exhibit 2."

Mr. TOWNSEND.—We object to the legend on here, because it is misleading. This says, "Previous to M. E. Layne's invention."

Mr. LYON.—Everything but the legend. [543]

Mr. TOWNSEND.—I think it should be covered up. I have no objection to the print, if this legend be excluded.

Mr. LYON.—All right; any way you want on the legend.

Q. Now, you have referred to the pit pump installation, Mr. Layne. Was that in common use prior to the introduction of the well mechanism of the patent in suit?

Mr. TOWNSEND.—That is objected to as assuming a fact not proved by the record. If you want to ask if the pit pump was the general mechanism in use before, there is no objection.

The COURT.—Q. Prior to the date of the patent?

A. Yes, it was.

Mr. LYON.—Q. Was there also a well-pumping mechanism known as the auger type?

A. Yes. The auger type of pump was a pump that would go inside of the bore of the well, and did not need a pit, but the difficulty with the auger-type pump was if the well produced sand and the sand came in contact with the bearings it rapidly cut out the entire apparatus, and rendered it inoperative.

Q. Subsequent to the application for the patent

(Testimony of M. E. Layne.)

in suit, did you continue in the well-drilling business? A. Yes.

Q. What type of apparatus did you thereafter use, that is, after the date of application for the patent?

A. As soon as I could get my pump constructed, we used my own pump exclusively.

Q. You say that we used our own pump exclusively. Can you describe that briefly?

A. I think so. The pump was built, as we consider, along the lines covered by the patent, in which it may be possible to put a pump of large capacity inside of the bore of the well, obviating the necessity of digging a deep pit; it also made it possible to lubricate and give the pump the proper attention from the earth's surface. The power [544] transmission apparatus or well apparatus, as covered by the patent—

Mr. TOWNSEND.—I object to his legal construction of what the patent covers.

A. —was provided with or provided means whereby the shaft through which the power was transmitted and the bearings holding the shaft in alignment were protected by an outer casing which protected the shafting and the bearings from the sand that the water carried, which sand made it practically impossible to operate the pump any considerable length of time unless said bearings and shaft were protected; the shaft-enclosing casing through which the power was transmitted, performed the function of alignment, lubrication and

(Testimony of M. E. Layne.)

protection of both the shaft and bearings; it also provided means—

Mr. TOWNSEND.—Pardon me. This is going beyond the question. I think he has answered the question, which was as to the structure that he used.

The COURT.—Perhaps that is true.

Mr. LYON.—Maybe it is.

Q. Mr. Layne, in providing such a structure, what were the objects which you had in view, and which were accomplished by such power-transmitting structure, and what, if any, were the difficulties or things which you attempted to avoid thereby?

The COURT.—Hasn't he answered that?

Mr. LYON.—Not entirely; that brings in the very part that counsel is objecting to as not responsive to the question. I am only shortening this by allowing the witness to go ahead in his own manner and explain the whole thing, rather than one thing at a time.

The COURT.—Perhaps you had better go ahead and state what you have not already recited. If there is anything else [545] to be added to what you have said as to the objects of your invention, and the difficulty that you intended to overcome by its building, state it.

A. One of the main difficulties that we overcame and entirely eliminated from the work was the necessity of the big pit and cumbersome old type of centrifugal pump, which, in many cases, it was quite impossible to sink the pit to a great enough depth so that during the period that the pump was in operation the water plane would come within

(Testimony of M. E. Layne.)

the reach of the pump. With my system of installation covered by the patent, it may be possible to lower the pump in the bore of the well as the water plane receded, without in any manner changing the structure of the well proper, or the pit. It also provided means so that in many instances water could be lifted from greater depths by my system, under the patent, than it had ever been done before. We are now operating from two to four hundred foot lifts for irrigation work.

Mr. TOWNSEND.—If your Honor please, I think he is getting now beyond the question by referring to the patent.

The COURT.—Confine your answer, Mr. Layne, to what were the several features of advantage that you sought in your mechanism, and what the difficulties were that you obviated.

Mr. TOWNSEND.—It does not seem to me that we are concerned with the purpose. The patent speaks for itself.

The COURT.—I think I will let him state what the purpose was.

Mr. LYON.—Give the whole of your purpose in this invention, and what the difficulties were, and all of that which you sought to obviate. You have already told us about the pit pump, and [546] the ability to get a deeper well into operation. Now, what in regard to the mechanism, itself, directly?

The COURT.—He has already stated that he attempted to provide means by which he could lubricate and protect the machinery and bearings from the sand and water.

(Testimony of M. E. Layne.)

Mr. LYON.—Let me ask you this direct question: What was the reason for bearings along the pump shaft from the top of the well to the top of the pump? Why were they required?

Mr. TOWNSEND.—I think that is immaterial, what his reasons were. The patent, itself, is self-explanatory.

The COURT.—I think that must be very obvious. These bearings were old even in the old style of pump with a long shaft; it was necessary to have them. However, he may answer the question.

Mr. LYON.—Make it short.

A. The reason for bearings in a long line of shaft is to limit the whip or side strain that might be thrown upon it, but the particular purpose in this case was to so arrange these bearings in the shaft-closing and protecting casing in such a manner that the pump apparatus could be lowered in the well and the pump allowed to pump water bearing sands to a certain depth, or, rather, in large quantities, without affecting the bearings, or coming in contact therewith; the bearings being protected by the outer shaft protecting casing, which made it possible to space the bearings their proper distance apart, to hold the bearings in their proper relation to the shaft.

The COURT.—The question is, why did you have so many bearings. Is there any other reason than you have given? A. No.

Mr. LYON.—Now, in order to provide the necessary bearings, you have already said you supported the same as a part [547] of the enclosing casing?

(Testimony of M. E. Layne.)

A. Yes.

Q. What else, by so unifying your structure, were you enabled to accomplish by such enclosing casing?

A. We were able to place the pump at any desired point in the well, suspend the pump from the surface, operate the pump from the surface, lubricate the pump from the surface; in other words, we were not in any way required to go into the well for adjustment. It made the adjustment, the operation and care of the pump all possible from the surface.

Q. I notice in the patent that the enclosing casing is made up of sections, as well as the pump shaft in sections. What has the sectional feature of the enclosing casing to do with the question of the intermediate series of bearings?

A. At each end or each section of the pipe, there is a bearing plate. This sectional feature has a double function, one being that it makes the bearings and wearing parts of the pump accessible; another being it makes the shafting and shaft casing, discharge pipe casing possible to be assembled so that each section becomes a unit within itself, so that as the different units are added to the column the discharge pipe, shaft casing and shafting, the entire equipment is lowered an equal distance in the well, so that all of the apparatus necessary for placing the pump at any desired depth or at any depth in the well can be prearranged or prepared and equipped in the shop previous to going into the field.

Q. Then, if I understand you correctly, it was the fact that this pump shafting, the enclosing casing

(Testimony of M. E. Layne.)

and the well casing were all in sections that enabled you to lower the pump in the well as required. Is that correct?

A. The discharge casing, not the well casing, yes. The pump could also be [548] lowered in the well where the discharge casing was omitted, and placed at any desired point in the well.

Q. To what extent, if at all, Mr. Layne, have you or any of the corporations with which you have been connected manufactured and sold the pump mechanism embodying the features of your invention, as you have just explained the same to us?

Mr. TOWNSEND.—That is objected to as leading and assuming a fact not established by the record, that there was any invention here. I think he has particularized more as to the structure manufactured, without reference to any patent.

The COURT.—Overruled.

A. Well, it runs into several millions of dollars. The exact amount I am not able to say; possibly twenty million.

Mr. LYON.—Q. And in what portions of the United States have such installations been made?

A. Over the entire United States and Canada; some in foreign countries—Russia, Japan and Canada.

Q. After you commenced first placing this mechanism on the market in Texas, as described by you, what thereafter was generally installed in Texas and Louisiana in irrigation wells?

A. In all lifts that were intended, like deep lifts, our installation was almost exclusively used; in the



(Testimony of M. E. Layne.)

shallower lifts, where a horizontal pump could be used until the water plane receded from the suction, the horizontals were used.

Q. Have you ever at any time removed the pit pump installations from any of the pit pump wells and substituted your mechanism?

A. In many hundreds of instances.

Q. In what portions of the country?

A. All over the United States, in all irrigation districts.

Q. Does that include the irrigation districts of California, [549] as well? A. Yes.

Q. What effect, if any, has, to your knowledge, been produced by the use of this pumping mechanism, limiting such answer for the present to the rice fields of Texas and Louisiana?

Mr. TOWNSEND.—I think that is calling for an expression of opinion as to which the witness has not shown the proper qualification.

The COURT.—Sustained.

Mr. LYON.—You are familiar with the conditions in the rice fields of Louisiana and Texas?

A. Yes.

Q. And have been since 1902? A. Yes.

Q. And you are familiar with the drilling and operation of the irrigating wells of those sections?

A. Yes.

Q. State what apparatus has generally been used in those districts which I have mentioned, since the time I have mentioned?

A. Our apparatus, covered by the patent.

Mr. TOWNSEND.—I move that that be stricken

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(Testimony of M. E. Layne.)

out as not responsive to the question.

The COURT.—I think I will let it stand. Overruled.

Mr. LYON.—What effect, to your knowledge, has the general adoption and use of the well mechanism of your patent in suit had upon the rice industry of Texas and Louisiana?

Mr. TOWNSEND.—Your Honor, that is calling for a legal conclusion. I have no objection to his stating how many pumps he has put in.

The COURT.—Do you object to it?

Mr. TOWNSEND.—I do, as calling for a legal conclusion.

The COURT.—I am not sure how legal it will be. I do not think the witness is competent to answer that question. Proceed.

Mr. LYON.—Are you acquainted with the defendant, Halstead? A. Yes. [550]

Q. How long have you known him?

A. Eight or ten years; the exact date I first met him I do not recall.

Q. Was he at any time ever connected with the Layne & Bowler corporation, the plaintiff in this case? A. Yes.

Q. In what capacity? A. In various capacities.

Q. First in what capacity?

A. As I remember it, he was first salesman.

Q. And thereafter he became a stockholder and one of the officers of the corporation, did he?

A. Yes.

Q. And as such, fully acquainted with and had full opportunity to know the well mechanism manu-

(Testimony of M. E. Layne.)

factured by the plaintiff company? A. Yes.

Q. And was engaged in the sale thereof in the State of California? A. Yes.

Q. Thereafter, in the year 1914, did he change his relation to the company?

A. About that time he changed his relation in that he represented us through a commission form of salary, rather than a fixed salary; but, otherwise, he was our representative.

Q. After that date, his relations with your company, as such representative in any manner were terminated, were they? A. After what date?

Q. After 1915 or 1916.

A. The exact date I do not recall, but he ceased to represent us on a commission form of basis, and continued to manufacture or went to manufacture, or did manufacture of pumps of his own.

Q. Were you able, Mr. Layne, at first to ascertain exactly what form of pump mechanism Mr. Halstead was manufacturing?

A. We attempted to get this information, and made a number of attempts, but failed in our different attempts to get this information. [551]

Q. You learned of Mr. Halstead's, and of defendant Vaughan's connection with the defendant, Western Well Works, Inc., did you? A. Yes.

Q. Did you attempt to ascertain exactly what construction of well mechanism said defendants were making?

A. I requested a working drawing of them to show just what they were making.

The COURT.—Requested from whom?

(Testimony of M. E. Layne.)

A. I requested Mr. Vaughan and Mr. Halstead to furnish me working drawings to show just what they were making, in order that I might satisfy myself with relation to whether or not, in my opinion, they were infringing our product, and Mr. Halstead and Mr. Vaughan assured me in one conference that if I would visit San Jose that they would show me through the shops. I made such a visit and requested the privilege of making an investigation of their product, and they denied me this privilege. In order to ascertain just what was being done, we went into the field and bought one of the Western Well Works pumps and removed it from the well for inspection.

Mr. LYON.—Q. Now, prior to this visit to San Jose to defendant's Western Well Works, Inc., shop, when you were refused admission, you had notified the defendants that you claimed that they were infringing the patent in suit?

A. As I now remember, yes.

Q. And Attorney Charles E. Townsend, representing the Western Well Works, had correspondence with your attorney, Paul Synnestvedt, in Philadelphia? A. Yes.

Q. Why was it, Mr. Layne, that prior to last fall you did not actually commence suit for an injunction against the defendants herein?

A. We were unable to determine their structure.

Q. Was there any reason in particular why you found it would [552] be absolutely necessary to procure one of their structures before bringing such suit?

(Testimony of M. E. Layne.)

A. We were without information as to what their structure consisted of, and without such information we were not in a sufficient position to bring suit, without that knowledge; in other words, we wanted to know definitely what they were doing, and if, in our opinion, they were not infringing us, we would be foolish to bring suit.

Q. You were furnished with a copy of a letter from the defendant, Halstead, to your attorney, Paul Synnestvedt, and one from Mr. Charles E. Townsend, as attorney for the defendant, to Paul Synnestvedt, in which they advised you to find out exactly what they were doing before you brought suit, were you not? A. Yes.

Mr. TOWNSEND.—I object to these letters being stated by the witness. I think the letters, themselves, are the best evidence.

Mr. LYON.—The letters are in evidence in San Jose, and there is no question about that one fact. That is all I want.

Mr. TOWNSEND.—I would like to have the letters presented in court.

Mr. LYON.—All I want it for is that one statement.

Mr. TOWNSEND.—I want the letters.

Mr. LYON.—We will reserve the right to produce that. It is already of record in San Jose.

Q. Mr. Layne, what has been your physical condition during the last four years?

A. I have been very ill. I was taken ill four years ago last February, and with a slight recovery I was able to go about my work under considerable

(Testimony of M. E. Layne.)

effort, but have not been in my normal condition since that time. I have [553] been somewhat better the last year, but am still very weak.

Q. Has that had anything to do with the question of your following up this question of infringement by the defendants?

A. Yes. I have been physically unable to give the work the attention that it should have.

Mr. LYON.—Plaintiff has offered in evidence a copy of the contract dated October 1, 1914, between the Layne & Bowler Corporation and Stanley M. Halstead and P. E. Vaughan, being the contract referred to in the bill of complaint and admitted in the answer, and it is stipulated that if there is any error to be found in this copy it will be corrected by comparison with the original, one of which defendants' counsel has in his possession. Is that correct?

Mr. TOWNSEND.—There is no objection to the contract as far as being a true copy is concerned, but I do object to its admission in evidence as immaterial, irrelevant and incompetent. This suit is not based on a contract. It is a plain patent suit. It is well recognized that no estoppel can arise from any recital in this contract or any contract unless it is the essence of the contract, nor is the recital binding in that action unless it is founded on a contract. This action is not founded on a contract, and the contract has no place in the record. If counsel wants to point out further the object for which he wishes to have it introduced and considered by the Court, I want an opportunity to argue

(Testimony of M. E. Layne.)

as to that, because he is obviously offering it for the purpose of estoppel; before I assume that, I would like to have counsel state it so that I may lay before your Honor now the authorities on that question, to show why it should not be considered or admitted.

The COURT.—I assume that counsel's position was outlined [554] in his opening statement.

Mr. LYON.—The contract is admissible not only on the grounds stated in my opening statement of estoppel, etc., but it is competent, itself, to show that prior to entering on the infringing acts these parties were our agents and did represent us. The contract is competent for both purposes. Of course, Mr. Layne has testified orally to their connection, but the contract, itself, shows it.

The COURT.—I do not believe there is any objection to its being received for that purpose.

Mr. TOWNSEND.—There is an objection to its being received for any purpose in this case.

The COURT.—As showing agency?

Mr. TOWNSEND.—There is no denial that there was a sales agency.

The COURT.—If there is no denial of it it will not be received for that purpose, then. It will be unnecessary to receive it for that purpose.

Mr. LYON.—Then it is offered for the purpose stated in the opening statement.

Mr. TOWNSEND.—Then it is not admissible, nor in any way binding at this time on the question of estoppel or on the question of any allegation regarding validity of the patent. The authorities, I

(Testimony of M. E. Layne.)

believe, are quite clear on that point.

The COURT.—Let me see the contract. I have not seen the contract. That I may understand you, what is your point, that the contract cannot be interpreted as an estoppel, or that, as a matter of law, it cannot be received, even though in form it would constitute an estoppel?

Mr. TOWNSEND.—As a matter of law, it does not constitute [555] an estoppel.

The COURT.—Why does it not, as a matter of law?

Mr. TOWNSEND.—It is against public policy.

The COURT.—Regardless of the fact that the contract expressly obligates the parties to recognize the amount of the contract, still you claim that it would not, as a matter of law, constitute estoppel, because it is a matter against public policy?

Mr. TOWNSEND.—Against public policy. Now, that the contract has manifestly expired, the contract having been for four years, from October, 1914, and that time having elapsed, and the contract having actually been discontinued, as to operations by the parties later, a matter which we do not need to go into, but it never ran four years. But now the contract has expired. The estoppel, if any ever existed, ceased; furthermore, there are conditions in there which would have made that contract unenforceable against defendants by people seeking to benefit by it. Now, it lacked mutuality. The clause I read yesterday about their being forbidden to handle any other device, was in contravention of the Clayton act, and the acts against restric-



(Testimony of M. E. Layne.)

tion of competition. I could probably read an excerpt to you from the Supreme Court of the United States—

The COURT.—If that is your position, I shall receive the instrument without prejudice to your right to argue that question later.

Mr. TOWNSEND.—And to introduce evidence on our complete defenses?

The COURT.—Yes.

Mr. LYON.—If your Honor please, we wish to reserve an objection [556] and exception to the receiving in evidence of the prior art; if counsel attempts in defense to put in the prior art and anticipate the patent, or the other defenses of want of invention, etc., we wish to have it understood that we shall object.

The COURT.—You will be given a full opportunity. You need not cross that bridge before you get to it.

(The document was marked "Plaintiff's Exhibit 3.")

Mr. LYON.—We have produced here, your Honor, the pump that Mr. Layne says he bought of the Western Well Works' installation, and I will ask counsel for defendant, he having examined the same, if he is prepared now to stipulate that it was manufactured and installed by the defendant on the Anderson ranch, near Stockton, California. We will prove the condition of it, and the circumstances under which we removed it, and all that. I want to see if they can make a partial stipulation, at least, to save time. This was removed prior to the com-

(Testimony of M. E. Layne.)

mencement of the suit, and after we got it, it was the installation upon which the suit was based.

Mr. TOWNSEND.—My client advises me that in his belief it is a pump, not in its original form, though, but such as they put in on the Anderson ranch in 1916. They put several down there, and it appears to conform to the construction, except that the pump has been materially changed.

The COURT.—Materially changed by whom?

Mr. TOWNSEND.—Plaintiff might answer that.

Mr. LYON.—We will prove that, except as you see sections that have been cut out, so that we could see the interior, is is now in the same condition as when removed from the well. I will offer that proof.

The COURT.—Is there any part there that was not there when [557] you sold it?

Mr. TOWNSEND.—There is a great deal that has been cut away. Of course, that is absent from what the condition of the pump was when it was put in. Our people put in a complete pump.

The COURT.—Oh, yes, but is there any part that was not in the pump when you installed?

Mr. TOWNSEND.—As far as a casual inspection in the short time allows, there does not seem to be anything changed, but we cannot tell how its operation will be now, or how this was operated when the plaintiff took it out.

The COURT.—No, but there is nothing here which was not in the pump when you installed it?

Mr. TOWNSEND.—Nothing as far as appears.

Mr. LYON.—Subject to that stipulation, and with the understanding that we will treat fairly the his-

(Testimony of M. E. Layne.)

tory of that pump, we offer it in evidence as Plaintiff's Exhibit 4.

(The pump was marked "Plaintiff's Exhibit 4.")

Q. Now, Mr. Layne, calling your attention to Plaintiff's Exhibit 4, the Anderson pump, when did you first see it, yourself?

The COURT.—I do not see where that is material.

Mr. LYON.—Yes. I am going to show certain tests were made for the purpose of ascertaining whether there is lubrication by the method of these leaking joints, or whether there is another method of lubrication. I am coming directly to it.

The COURT.—Very well.

Mr. LYON.—Q. When did you first see it?

A. As I remember last winter.

Q. What changes, if any, have been made in this since it was brought to your place at Los Angeles?

A. No changes whatever, [558] except that it was cut open for easy view of the different parts, so that we could see how each part functioned with relation to the other.

Q. Are you familiar with this installation?

A. Yes.

Q. Have you also examined the head of the pump, which is here? A. Yes.

Q. Now, will you explain to the Court this Anderson pump construction of the defendant, Plaintiff's Exhibit 4, and compare the same with the patent in suit, particularly with regard to the shaft-enclosing casing, bearings and lubrication?

Mr. TOWNSEND.—Just a minute; that is ob-

(Testimony of M. E. Layne.)

jected to as no proper qualification has been shown by the witness to testify as to the defendant's pump, it is not shown that he ever operated one, or saw one operated, or knows anything about its mode of operation. You have here before you a dismantled section which gives no idea of its mode of operation, and there is no proper foundation laid.

Mr. LYON.—Q. Were you able, as the pump came to your place in Los Angeles, to determine the lubrication features and operation of the pump?

Mr. TOWNSEND.—The same objection.

The COURT.—Overruled.

A. Yes.

Mr. LYON.—Please answer the question, make the comparison that I have asked.

Mr. TOWNSEND.—I think, your Honor, he should explain the condition in which that pump came to him in Los Angeles.

Mr. LYON.—I am going to prove all that by another witness, anyway, the entire pump end of it. I wanted to get down to the meat of this case, if I could, in a hurry. I will put two other [559] witnesses on, Mr. Townsend, regarding that matter.

A. Before this pump was withdrawn from the well, I laid out a plan by which the removal of the pump was made possible without in anywise taking any of the parts down, or in any way unassembling same.

Q. You were not present at that, were you?

A. I was not present, but I laid it out and had photographs of my plan.

Q. Just keep to what you personally know about

(Testimony of M. E. Layne.)

this matter and we will put on other witnesses as to the other matter. Just tell us about the test you made of this pump, or the comparisons that either you, yourself, made, or that you saw made.

A. In the first place, the tube that surrounds the shafting that enters the bearing is continuous from the pump neck to the top of the well, which makes connection with the pump head. A 3-inch pipe connects up through the discharge T into the pump head proper, so that the water, as it is being pumped from the well by the pump discharges up through the casing member here, and outside of the shaft casing. The lubricant, as it is applied, works its way down through the shaft casing, and—

Mr. TOWNSEND.—Now, your Honor, he never has seen one of these pumps in operation, and so he can't tell how it is lubricated.

The COURT.—Well, he agrees with your statement, anyhow.

Mr. TOWNSEND.—I don't know how much of this he is going to weave into the patent; that is what I am worrying about. I admit that he can explain his own patent.

The COURT.—He is stating precisely what you stated in your opening. Proceed with the answer.

A. The lubricant is then admitted into the well through the [560] drain port or vent in the pump neck—

Mr. LYON.—Q. You are now pointing, Mr. Layne, to the pump neck there, where the incline drain tubes are?

(Testimony of M. E. Layne.)

A. Yes, sir, I have my pencil on the incline drain tubes.

Q. That is down in the well?

A. That is down in the well, at the pump head, at the top of the pump bore, that being our pump bore there, or pump neck. The same construction follows all the way through in that that is in this, the only difference in the patent from that is that the discharge pipe, in place of being concentric in the shaft-enclosing and protecting casing, is on one side of the pump, so that the water in the one shown in the preferred form in my patent comes up through a discharge pipe that does not surround the shaft-enclosing and protecting casing, but does come up on the outside of it.

In my second form, it shows the discharge pipe can be eliminated, and the casing of the well perform the function, and in that case the whole casing would be concentric with the shaft-enclosing casing. In other words, I did not want to restrict myself as to the concentric form of discharge or side form of discharge, or any other manner of discharge of the water. The point I was after and attempting to cover, and I believe we have successfully accomplished the same, is the protection of the shaft through which the power is transmitted from the earth's surface through the shaft-enclosing and protecting casing to the pump proper, placed at any desired point in the well. To accomplish this, the means by which we get the bearings in the shaft casing—the shaft casing and bearings in connection with the discharge pipe performing the function of

(Testimony of M. E. Layne.)

the old cumbersome frame necessary in the open dug pits, replaced or made it possible so that the pump could be inserted in the [561] casing of the well and not necessary to allow room for a man to go up and down in the well so that the bearings could be properly lubricated and adjusted, and the pump also. And the bearing feature, and the shaft feature, and the lubricating feature, and all of that were made possible with my invention, and the installation made possible from the earth's surface, as well as the power transmission. Therefore, we claim that every part of the Halstead structure, or the Western Well Works structure, every pipe, the enclosing casing, performs the same function as our enclosing casing, the bearings perform the same function, the lubricating performs the same function; the shaft-protecting casing shuts out the sand as it is being pumped through here, so that the lubricant can gravitate or work its way down through the shaft casing, and as it works down it both lubricates and protects in every way every bearing throughout the entire line of shafting. One drop of oil admitted at the surface, or a dozen drops of oil, lubricate each bearing as it passes from one to the other, and consequently there is no room for any dirt to enter; there is no room for sand to enter. The alignment is made perfect; the power transmission feature through the lubricating tube is made possible. All of these features are clearly shown in the patent. It shows a section of shaft casing, a section of shaft and a section of discharge pipe, all tied together so that it can be as-

(Testimony of M. E. Layne.)

sembled and unassembled at the different points at which they connect; each section becomes a unit in itself, so that the pump can be carried at any place in the well that is to be desired.

Q. Mr. Layne, you were not here yesterday and you did not hear the opening statement of counsel for the defendants. He stated, [562] and if I am incorrect in this I request counsel for defendants to correct me, that each joint of the shaft-enclosing casing in the defendant's structure was loose upon the part to which it attached, so that water could leak in and fill the shaft-enclosing casing, such leakage occurring at both ends of each section of such shaft-enclosing casing; bearing that statement in mind, what did you find in this Anderson pump, Plaintiff's Exhibit 4, in that regard, when you examined the same?

Mr. TOWNSEND.—We object to the question as immaterial, and no foundation laid. There is no showing as to what may have been done with that pump since it left the defendant's hands.

Mr. LYON.—I will prove that.

The COURT.—The objection is overruled; you may answer.

A. On receiving the pump in Los Angeles, I went over the same carefully and made several tests. First, we assembled the pump, just in sections as it would be assembled—

Q. Were those joints opened, or not?

A. No, sir, they were closed.

Mr. LYON.—Q. What is the white that we see at this back joint of shaft-enclosing casing, right



(Testimony of M. E. Layne.)

here, referring to Plaintiff's Exhibit 4?

A. White lead; that is white lead that was on there when we removed the pump from the well.

Mr. TOWNSEND.—We move that that be stricken out. He didn't see the pump when it was removed from the well; he first saw it in Los Angeles.

Mr. LYON.—Q. You mean by your answer when you saw it there first, do you? A. Yes.

Q. Examining this pump, did you measure or examine the connections under which the ends of the shaft-enclosing casing fitted, in Plaintiff's Exhibit 4? A. Yes. [563]

Q. What did you find in that regard?

A. We found that the tube of the bearing was straight down to within a short distance of the main casting, and from there it was slightly tapered, so that when a 3-inch pipe was pushed down to or nearly its proper position the 3-inch pipe would gradually tighten as it took its seat, so that it performed a perfectly pressed closure at that point. Such closure was demonstrated and proven by me in my test there. We assembled the section of this casing and put on pressure and proved that although the pump being submerged at considerably over 100 feet of submersion, no leakage whatever occurred through the port or through the shaft closing casing.

The COURT.—Q. Why would not leakage occur through the port?

A. This, you see, is shut off from this portion; this is a portion of the pipe with the cut-away por-

(Testimony of M. E. Layne.)

tion remaining intact. That is, we just cut out a piece of the pipe right from there to there, so that it might be visible.

Q. But if oil can come out through—

A. We were not testing it for oil then, we were testing it for the inflow of water from this port into the tube; in other words, here is a column of water passing up here from the pump, and their contention is that as that column of water passes up here it freely flows into the shaft-enclosing casing, and each end of each section of pipe—

Q. I understand that, but why wouldn't water come in through that vent if oil would go out from it?

A. It is put in in a different section of pipe; this is the discharge section, and this is the lubricating section.

Mr. LYON.—Q. Those drains are carried out outside the discharge pipe?

A. Yes, outside the discharge pipe. Those drains [564] intercept the lubricating feature of the pump only, but by passing through the discharge column; the discharge column of water comes up through here, straddling this, and goes up through this portion and around here.

Q. I understand that, but if the pump is set down in water, if it is submerged in water, that oil is discharged into the outer pump of the well, as I understand it.

A. Yes. Here is a section of the pipe over here, and when—

Q. Can't you answer the question: Doesn't this

(Testimony of M. E. Layne.)

part of the pump set down in the water?

A. Yes, when it is not in operation; when it is in operation, there is usually no water here, so that the drainage runs right out. On the test, we were outside, we were not in the water at all.

Mr. LYON.—Q. And if any water got into this inner tube, or the shaft-enclosing casing, where would that water come out?

A. It would come out through the port.

Q. Just describe that test; describe what you did, and whether it showed that these joints of casing were tight.

A. That is just what I want this section for; I want to refer to that.

The COURT.—No, we cannot take the time for that. Just answer the question.

A. All right. Here is the section showing your inner tube right down through here. It is tapped there. We put a pressure gage on that. We run that to 57 pounds, which is considerably over a 100-foot head, so that the water was in the discharge column, and showed by the pressure gage it did not enter the oil column at all, whereas if the shaft casing had been loose on the hub the simple filling of the shaft casing would have permitted water to have worked out through the hub. These are different views showing tests [565] I had run on that. Here is one view showing the pump. If the water—

Mr. TOWNSEND.—Your Honor, this examination now seems to be taking an immaterial form. There was no shafting on there, and the pump was not in operation. It was a dummy test, at which

(Testimony of M. E. Layne.)

none of the defendants were present, or at which none of the representatives of the defendants were present. There was no pump shaft in there.

A. (Continuing.) The shaft has nothing to do with the pumping of the water. What we were testing for was this: We had the inner tube in there, just as this shows there, and were putting a pressure into the discharge pipe against the inner tube. The pressure was here, and it could enter here if this would permit the entry of water. But that closed off the entry of water and there was no leakage whatever around the shaft-enclosing casing to be noticed at all.

Mr. LYON.—Q. This is the apparatus, is it, a photograph of it? A. Yes, sir.

Mr. LYON.—We offer this in evidence and ask that it be marked "Plaintiff's Exhibit 5."

Mr. TOWNSEND.—If your Honor please, in regard to any additions to this pump since we set it out, this new member here, which I will mark with an "X," is something that was put on.

Mr. LYON.—Yes, exactly, we closed that off.

Mr. TOWNSEND.—We haven't anything like that on our pump.

Mr. LYON.—We offer that place now which counsel has just marked; I ask to have it marked "Plaintiff's Exhibit 6," the portion tested, and the apparatus as tested in accordance with the testimony of this witness as just given. We do this just to show, if anything comes up, that we produced the apparatus. And we offer to repeat that test if counsel for the defendant [566] desires it.

(Testimony of M. E. Layne.)

Q. Now, Mr. Layne, you say this test you made disclosed that the joints of the casing were tight, so that the water could not leak therein.

A. Yes, sir.

Q. What was the condition of the apparatus otherwise, as to its method of lubrication, and how did it compare with that of your invention?

Mr. TOWNSEND.—We reserve the same objection to that, your Honor.

The COURT.—Very well.

A. The shaft, as it was unassembled from the shaft casing, showed good quantities of grease on the shaft, and the shafting also to be bright, in perfect preservation. As far as the oil was admitted, the shaft shows to have been in good shape, but where the oil was delivered to the point at which the sand and dirt came in contact with the shaft, it shows it to have been slightly greater worn.

Mr. LYON.—Q. Did you examine these joints of the shaft-enclosing casing to see whether there was rust inside of them, or any indications of water having ever entered? A. Yes.

Q. What did they disclose in that regard?

A. They disclosed that they were thoroughly lubricated, and entirely bright, just as if they had been in a storeroom. It shows it right here.

Q. I notice on the upper end of the section of dry shaft of the pump, Plaintiff's Exhibit 4, there is some heavy grease still on there; do you know what that is?

A. That grease was just as I saw it on the shaft when it was returned.

(Testimony of M. E. Layne.)

Q. In quantity, the same, or otherwise?

A. No, there was probably a slightly greater quantity. [567]

Q. This has been in storage in your warehouse in Los Angeles since early last fall, I believe?

A. Well, since last winter, some time.

Q. You have stated that in the Western Well Works pump, Plaintiff's Exhibit 4, the oil would go down through from bearing to bearing, and then out the end of the shaft-enclosing casing, and out the ducts at the bottom. Please explain that feature of this pump, and its relation to your invention, and how it compares, etc., in degree, as well as otherwise.

Mr. TOWNSEND.—The same objection, your Honor.

The COURT.—The objection is overruled.

A. They are identical one with the other, so far as the application of the lubricant to all of the bearings from the pump to the top of the well; they are identical; the only difference being that they provide a duct by which the lubricant, when it reaches the top of the pump, can pass into the well in place of the lubricant as it works through our shaft-enclosing casing passing in the pump portion and is carried out directly with the water being pumped, while there is—

Mr. TOWNSEND.—Just a moment. If your Honor please, he is reading something into that which is contrary to the very patent, itself. The patent is the best evidence.

Mr. LYON.—Well, we deny that statement; he is not doing anything of the kind.

(Testimony of M. E. Layne.)

The COURT.—That is his interpretation of it. You can cross-examine him on that, and you can rebut it.

Mr. LYON.—Q. From your examination of this Anderson pump, Plaintiff's Exhibit 4, was that a free circulation down at the bottom out from the shaft-enclosing casing?

A. It is free after it comes in contact with the ports, but preceding the [568] entry of the oil at the port opening the oil is retarded at each shaft-bearing, just the same as it is with our structure, and performs the same function in the same manner.

Q. Right where your ends are cut into the shaft-enclosing casing, what kind of a bearing was in this pump at that point? A. Which pump?

Q. This Anderson pump.

A. The bearing just as it is shown there. The bearing at the pump neck and out of the ports contact the bright portion of the sub-shaft, and the lubricant worked out through the bearing around the shaft where it is bright into the ports, and then was discharged into the well.

Q. This is the shaft you just put your pencil on?

A. Yes.

Q. And this is the bright portion? A. Yes.

Q. That fitted in here? A. Yes.

Q. Why is it that this is evidently abraded and cut, and also encrusted with scale or rust, if you know?

A. The pressure of the water, as it is being pumped, contacts the lower end of the bearing,

(Testimony of M. E. Layne.)

or the bearing below the port, and passes through the bearing up to the point of the port, and from there it is relieved and runs into the well; consequently, any sand that is being carried with the water being pumped contacts the shaft-bearing below the port portion, and is nonprotected below the port portion, which accounts for the abrasion of the shaft and its worn condition, as shown.

Q. What accounts for the bright portion above that?

A. The lubricant coming in contact with the shafting at that point and passing out through the same port as that which the water passes the other portion of the bearing.

Q. At the time that this was brought to your shop in Los Angeles, did you examine this upper portion of the bearing and this portion [569] of the shaft, to see whether there was any indication of sand or grit, or detritus having cut through the shaft or the bearing at that portion? A. Yes.

Q. What did you find?

A. I found it in its present condition, uncut and thoroughly lubricated.

Q. Then you were able to determine from that examination if this condition of the device, the portion of the bearing which is above the outlet ducts, had been thoroughly lubricated and closed against the entry of sand? A. Yes.

Q. And of water? A. Yes.

Q. And you were able to determine from that inspection of the several joints of the sectional shaft-enclosing casing that they were tight against the



(Testimony of M. E. Layne.)

entry of water? A. Yes.

Q. Now, to conclude your testimony in that regard, and bearing in mind the opening statement of the counsel for the defendant, that the mode of operation was water lubrication, or lubrication by water with four or five drops of emulsifying oil per minute, what have you to say, based upon your inspection and tests of the defendant's pump, in that regard?

Mr. TOWNSEND.—There is no foundation for that question. He has no experience in the mode of operation of the pump.

The COURT.—Well, as to the pump in question here, you may answer the question.

Mr. LYON.—The Anderson pump.

A. The Anderson pump structure showed clearly that the ends of the shaft casing thoroughly contacted on the bearing member in a pressed fit condition, and was or had been treated with white lead, and under actual tests showed that no entry of water could possibly occur. In addition to that, the grease, the bright condition of the shaft, the shaft casing being filled with grease in a large measure, would still further show that the [570] shaft casing had not been subjected to a continuous flow of water during the period of operation.

Q. Referring to the top-end of the shaft-enclosing casing, and to the head of the pump, state from your examination whether or not the shaft-enclosing casing was closed or open at its top?

A. Yes, it was closed at its top.

Mr. LYON.—I will ask counsel for the defendant

(Testimony of M. E. Layne.)

now to examine a paper which I will now hand him, and to state whether he will stipulate that that is the advertisement of the defendant published in the Fresno Morning "Republican" on Sunday, February 29, 1920. I think he is familiar with it. I want to save time by asking counsel to stipulate to that.

Mr. TOWNSEND.—This advertisement is one put out by defendant.

Mr. LYON.—And put out for the purpose of selling the defendant's pumps?

Mr. TOWNSEND.—For all legitimate purposes.

Mr. LYON.—We offer this in evidence as Plaintiff's Exhibit 7. There is a particular section of it I want to call to your Honor's attention. I assume, your Honor, that all of these exhibits which have been offered may be considered as read?

The COURT.—Oh, yes.

Mr. LYON.—I want to call your Honor's particular attention to the heading of "Lubrication"; also the "Pump discharge" column. Well, your Honor might prefer to read this yourself. It has particular reference to the water lubrication and the leakage.

Q. You are acquainted with the defendant Ross?

A. Yes.

Q. At any time was he in the employ of the Layne-Bowler Corporation? A. Yes.

Q. Do you know what his connection is now with the Western Well [571] Works, Inc.?

A. No, sir, I do not.

Mr. LYON.—Will counsel for the defendants

(Testimony of M. E. Layne.)

stipulate that he is one of their sales agents, and was at the time the suit was brought?

Mr. TOWNSEND.—I understand that that is correct.

Mr. LYON.—Now, Mr. Layne, has the Layne-Bowler Corporation, yourself or any one of your licensees, marked in any manner the well pumping mechanism which you have manufactured and sold, and asserted to contain the invention of claims 9, 13 and 20 of this patent?

Mr. TOWNSEND.—That is objected to as calling for a legal construction of the claims in the patent.

Mr. LYON.—No. I am asking him if those he sold were marked in any manner. It is simply to show that we put the statutory notice on them all. I am simply asking whether on every one of them they put out they did the necessary marking.

The COURT.—He may answer.

A. Yes.

Mr. LYON.—Q. How did you mark them?

A. The numbers and the dates of the patents issued covering such structures.

Q. And the word "patented"? A. Yes, sir.

Q. In other words, the word "patented" and the day and date of the patent? A. Yes, sir.

Cross-examination.

Mr. TOWNSEND.—Q. That patent marking, I suppose, also carried with it this reissue patent, No. 13,467, September 24, 1912, for the whole mechanism?

Mr. LYON.—We object to that as immaterial

(Testimony of M. E. Layne.)

and irrelevant. This is simply encumbering the record. There are a large number of other patents. It is immaterial in this case whether there [572] are others. We are not suing on that patent. It is not cross-examination.

Mr. TOWNSEND.—The materiality of it is this, that these so-called pumps that he has been talking about, the Layne & Bowler pumps, are made under this reissue patent, taken years later, and embodying changes, and not made under the other patent. I simply ask him whether his pumps bore that.

The COURT.—He may answer.

A. They bore both numbers, both the original patent and the reissue patent.

Mr. TOWNSEND.—Q. You said you got the defendant's pump from the Anderson ranch sometime last winter; can you give me the definite month?

Mr. LYON.—Mr. Townsend, I do not want to interrupt you, but I will tell you now that I will prove the definite date by another witness, and also prove its transfer to Los Angeles.

Mr. TOWNSEND.—If you will state the date you got it, and the date Mr. Layne saw it, that will be sufficient.

Mr. LYON.—May 19, 1919. It arrived in Los Angeles about three weeks later.

Mr. TOWNSEND.—Q. Mr. Layne, you stated that you did not bring suit until the time that this suit was brought in December last, for lack of evidence, and that you deferred bringing suit until you had, as you thought, proved the infringement: Is that correct?

(Testimony of M. E. Layne.)

Mr. LYON.—You have the wrong date. This suit was filed in September, last, either in September or October.

Mr. TOWNSEND.—Well, we can get the exact date when it was filed.

The CLERK.—It was filed October 6, 1919.

Mr. TOWNSEND.—October, 1919. [573]

A. Yes, that is what I stated.

Q. When did you first hear of the incorporation of the Western Well Works?

A. Did you say when, or why?

Q. When? Was it 1915, or 1916?

A. I could not tell you the year.

Q. Was it as early as 1918?

A. I don't believe that I heard of it until I returned from the east, after my illness, when I was confined in the hospital at El Paso. It was in the latter part of 1918, as I now remember it.

Q. Refreshing your memory a bit, can't you carry your recollection back a couple of years, and don't you know that the Western Well Works was doing business as early as the year 1916, selling these pumps? A. No, sir, I do not.

Q. Don't you know that as early as 1915, the latter part of 1915, or the early part of 1916, one of these pumps in the neighborhood of Salinas, and in the neighborhood of where there was located a well-digging apparatus over which you had a controversy?

Mr. LYON.—I don't wish counsel to waste time under a misapprehension. Mr. Layne, himself, personally, was not connected with this particular

(Testimony of M. E. Layne.)

plaintiff at that time, and he had nothing to do with the matters that you refer to. Of course, he heard of it by hearsay, but that is all.

Mr. TOWNSEND.—Maybe you can answer the question and it will shorten this up. Did not plaintiff have knowledge of the existence of the Western Well Works as early as the latter part of 1915 or the early part of 1916?

Mr. LYON.—Some time in 1916; I cannot fix the exact time.

Mr. TOWNSEND.—And the plaintiff also knew that the defendants were manufacturing a type of turbine pump? [574]

Mr. LYON.—Yes, and the plaintiff in this case was asserting that they were infringing, and the defendant was denying that, and we were endeavoring to ascertain exactly what they were doing.

Mr. TOWNSEND.—Your stipulation that they were threatening infringement answers my question.

Mr. LYON.—We were threatening suit during all that time, and were endeavoring to get to an issue with the defendant, and endeavoring to get an actual statement of what the defendants were actually putting out. And I suppose in that connection, Mr. Townsend, you will stipulate that you wrote, you had better find out exactly what we are doing before you bring suit.

Mr. TOWNSEND.—That was in December, 1918, when your attorneys in the east were threatening all of our customers, so we wrote a protective letter.

Q. It is also true, is it not, Mr. Layne, that prior

(Testimony of M. E. Layne.)

to the bringing of this suit on October 6, 1919, the defendant, Western Well Works, brought suit against the present plaintiff, in the Superior Court of the County of Santa Clara, to restrain the Layne & Bowler Corporation, the plaintiff herein, from threatening and otherwise attempting to intimidate its customers.

Mr. LYON.—Objected to as immaterial, irrelevant and incompetent, and not cross-examination; it has no bearing upon the issues of this case whatever.

Mr. TOWNSEND.—Equitable estoppel is one of the defenses.

Mr. LYON.—There is no estoppel pleaded.

Mr. TOWNSEND.—Yes, it is in the last paragraph; I read it yesterday.

The COURT.—I think I will let him answer, if he knows. He [575] may answer "Yes" or "No."

Mr. LYON.—We will stipulate that you brought suit at that time. If you produce the papers they can go in evidence. We will put in our answer. I suppose you will stipulate also that the Court denied you an injunction?

Mr. TOWNSEND.—After issuing a restraining order.

Mr. LYON.—The Court issued an *ex parte* restraining order upon your behalf, and then upon a hearing denied a temporary injunction and vacated the restraining order.

Mr. TOWNSEND.—I will offer the papers in that San Jose suit, with your Honor's permission,

(Testimony of M. E. Layne.)  
as Defendant's Exhibit "A."

Q. Mr. Layne, the plaintiff corporation has been a somewhat extensive advertiser in the past, has it not? A. Yes, sir.

Q. I show you a page from the Sacramento "Bee," Wednesday, December 31, 1919, and ask you if that is not the advertisement of the Layne & Bowler Corporation, plaintiff herein?

Mr. LYON.—We object to that on the ground that it is entirely irrelevant and immaterial to the issues in this case, and not cross-examination. The issue that we have to try here is solely the question, Has this defendant infringed upon the rights of the plaintiff? There is not even a cross-complaint, nor would the Court have jurisdiction of it, if there was malicious advertising against them.

The COURT.—What is the purpose of this?

Mr. TOWNSEND.—Equitable estoppel, that the plaintiff does not come into court with clean hands. It is always a good defense in an injunction on any matter, independent of infringement, or not.

The COURT.—The objection is sustained as not being cross-examination. [576]

Mr. TOWNSEND.—Q. Mr. Layne, in regard to Plaintiff's Exhibit 2, which shows an installation of a pit pump, I don't suppose you would have the Court understand that that is the system that is not used to-day?

A. The system that is used to-day almost universally is our system of enclosed shaft to protect the bearings.

Q. That is not an answer to my question.



(Testimony of M. E. Layne.)

The COURT.—You mean in case a pit pump is used, is that the type?

Mr. TOWNSEND.—Yes, sir.

A. When a pit pump is used, this is one of the types that is commonly used, but the pit pump is almost entirely being replaced, and there are very few new installations made of the old-style pit pump.

Q. I want you to answer this question: Is it not a fact that to-day a large number of pit wells are dug? A. Not to my knowledge.

Q. Not to your knowledge? A. No, sir.

Q. Have you been extensively over the irrigation fields recently?

A. Yes, we have our traveling men over the fields all the time.

Q. Is it not the fact that a large number of pit pumps are used to-day?

A. Only where the water plane is close to the surface and low lifts prevail.

Q. There are conditions under which, no doubt, the pit pump is desirable over the so-called enclosed line shaft, or turbine pump?

A. In no place is it desirable, but there are places where men have not the means to install the other, and they think it is cheaper with a shallow well to get along temporarily with a pit pump than to use the other.

Q. Referring to your patent, Mr. Layne, I mean the patent in [577] suit, will you state just what features shown in the drawings of the patent in suit, particularly Figure 1 and Figure 5, that in

(Testimony of M. E. Layne.)

actual practice you have not used, indicating the parts by the numbers shown in the drawings?

The COURT.—Can't you call his attention to them? You, doubtless, know what you have in mind. Ask him whether he has used them.

Mr. TOWNSEND.—Very well, your Honor.

Q. For instance, taking Figure 5, the wedges, 33, which contact with the well casing, 16: Have you ever used those?

A. At the time of my invention—

Q. Just answer "Yes" or "No."

A. We have not used a pump that would go in the bore of a well.

Q. I am asking for an answer to my question: Have you ever used the wedges, 33, for positioning the pump at any point in the well?

A. The wedges are not made for positioning the pump in the well.

Q. Please answer "Yes" or "No." Have you used those wedges, 33, for the function specified in the patent, or at all?

A. We have never used the wedges.

Q. Have you ever used the toggle numbers, 34 and 35, which connect with those wedges?

A. No, sir.

Q. Have you ever used the parts represented by the rods or links, 32, which connect with the toggles? A. No, sir.

Q. Have you ever used the rods or links, 29, which connect with the wedges, 33?

A. No, sir, those all being parts necessary to function the wedges as they were intended.

(Testimony of M. E. Layne.)

Q. And, referring to Figure 1, have you ever used the sliding sleeves, 28, 31, for manipulating those respective links, 32, 29?

A. They all refer to the wedges, which we have not used. [578]

Q. And, likewise, you have not used the stem members, above 27 and 30, to connect with those sleeves? A. We have not.

Q. Likewise, referring to Figure 5, have you used the stuffing box, 41?

A. No, sir, we never have in that particular form. We have used a brass or metal sleeve there, thoroughly lubricated, which performs the same function.

Q. Then your answer to my question is you never used the stuffing box, 41? A. No, sir.

Q. And you have never used the adjusting mechanism shown by the sprocket chain, 46, and the sprocket, 42, 42', 42'', shown in Figure 6 of the patent?

A. All being parts of the packing gland, we never have used it.

Q. And you have never used the pipe, 44, which is shown in Figure 5, down to the bottom of the shaft tubing? A. No, sir, we never have.

Q. And not using that, you have not used any other means to manipulate that sprocket chain: That pipe had a double function, 44, admitting lubricant and also working the adjustments of the screws of the packing gland?

A. No, sir, it was never intended for the admission of lubricant.

(Testimony of M. E. Layne.)

Mr. TOWNSEND.—If your Honor please, the patent would be the best evidence on that point, because it expressly states that the chief function of the pipe—the dual function of the pipe, 44, is to admit lubricant—rather, is to discharge lubricant or to admit air—perhaps I am slightly in error about that, and to manipulate the sprocket wheels by which the gland may be tightened.

Mr. LYON.—We do not admit that at all, your Honor.

The COURT.—Well, is that in the patent?

Mr. TOWNSEND.—I want to be sure about that. In regard to [579] the adjustment of the packing gland, the second column of page 2 shows it.

The COURT.—The question is as to whether or not that pipe was used for the admission of lubricant. I understood you to say that the patent so claimed.

Mr. LYON.—Just refer to the second paragraph of column 2, page 2, commencing at line 83.

“This pipe or tubular shaft 44 also serves the purpose of providing convenient means for forcing the liquid out of the pump shaft casing. By forcing air in at the top of the casing 20, by means of the pipe 52, the liquid can be forced down to the bottom of said casing 20, and by means of the small opening 45, in the bottom of the tubular shaft 44, the fluid can be forced out at the top 54, and keep the casing clear in order to leave the bearings clean therein and not interfere with the working of the pump, or by forcing fluid in at the

(Testimony of M. E. Layne.)

top 54, the operation will be reversed, and the fluid ejected from pipe 52."

On page 3, lines 73 to 79, he says:

"I consider it of great advantage also to arrange the pump shaft in a closed casing with stuffing-box at surface of ground at top of pump, so that by the use of the packing boxes an air-tight chamber can be maintained, and water kept out of the casing 20, or kept filled with clean liquid, if desired."

There is somewhere the matter of alternative action.

The COURT.—Isn't that alternative action you refer to the paragraph you have already read in column 2, page 2?

Mr. TOWNSEND.—I think so. It is at least used for discharge where it is not used for admission. It is used for [580] the admission of air. I will amend my question. I think the patent, though, speaks for itself.

Q. I understand, Mr. Layne, you have not used the pipe, 44? A. No, sir.

Q. Now, referring further to the same drawing, have you ever used the sectional shaft, 39 and 39', with loose sliding connections at their abutting end? In other words, spline the shaft and giving the sections a limited movement with relation to one another?

A. In our construction we have used in one or two instances a method of that kind, but our general practice is to use the screw and flat coupling.

Q. Where you use the spline section in the ex-

(Testimony of M. E. Layne.)

tended form of your patent, here, where the sections may slide inside of the sleeves, 48 and 48', being the thrust collar into which the shaft sections are splined, and loosely movable with respect to one another, such a construction would not permit of putting any weight on the shaft above, would it?

A. It only provides in such instances for carrying the weight of the shafting that is directly connected to the lower portion of such bearing.

Q. Such a loose coupling method would not permit of suspending the impeller from the top, would it?

A. No, sir. That was intended for deep lifts, where the proposition was supposed to have been carried in different loads.

Q. Consequently, this method of impeller suspension and the shaft coupling have never been put into use by you? A. Only in a few instances.

Q. It never has become your commercial product? A. No, sir.

Q. You have never used the thrust collars, then, 48 and 48', have you?

A. Not for thrust purposes, but for the shaft bearing purposes we have used them exclusively. [581]

Q. You have used a single thrust collar, like 48, in Figure 5, at the bottom of your pump structure?

A. We have never used the thrust collars in the two, only in very few instances; we have only used the collars connecting the shaft by thread methods.

Q. And you have done away with the use of the

(Testimony of M. E. Layne.)

thrust collars, 48, that we see working on the bearings?

A. So far as contracting the bearings, we have never used that as a commercial product, containing the bearings for thrust purposes.

Q. Simply to make it clear by reference to the defendant's model of the plaintiff's patented pump, which I will ask to have marked Defendants' Exhibit "B" for identification, the thrust collars and the bearing construction shown here, which have been marketed according to the patent, have not been used in actual practice?

Mr. LYON.—We object to counsel using the model for cross-examination, unless the witness has an opportunity to examine it. The witness has never seen it. There are features of it that do not exactly correspond with the patent. We think the Court should be fully advised with regard to that. It should not be just generally marked and then withdrawn. If the witness is going to be examined at all in regard to it, he should be given an opportunity to see that it compares with the structure; he should be given an opportunity to state whether it is correct or incorrect.

Mr. TOWNSEND.—I will not insist on the question, except—

The COURT.—I think he can state whether those particular features correspond to the drawing of the patent. It would not take him very long to determine that. You may go on.

Mr. TOWNSEND.—I will withdraw the question, your Honor. We [582] will identify the

(Testimony of M. E. Layne.)

model later. I wanted to make it clear—

Mr. LYON.—It would not take him more than five minutes to look at the model, and then he can answer any of your questions.

The COURT.—What is it you want?

Mr. TOWNSEND.—I wanted to make it clear that the thrust bearing was a construction not employed. I think he has answered that.

The COURT.—There is nothing before the Court, gentlemen. Proceed.

Mr. TOWNSEND.—No further cross-examination.

Redirect Examination.

Mr. LYON.—Q. Mr. Layne, Defendant's counsel has pointed out to you a number of features which are shown in the patent in suit, that you said that you have not used in your commercial structures; then, in view of your testimony that the commercial structures which you have embodied in well mechanism and sold, have become so generally in use, to what features, then, in this patent, do you attribute such popularity, and the general adoption by the public?

Mr. TOWNSEND.—Your Honor, that is immaterial and irrelevant, and calls for an expression of opinion which cannot help the Court in construing the patent. The patent is the best evidence. That is opening a wide field for speculation.

Mr. LYON.—There is no speculation to that, at all.

The COURT.—The objection is sustained.

Mr. LYON.—Q. What features of the patent in



(Testimony of M. E. Layne.)

suit are present in the commercial structures of well mechanism sold by you and to which you attribute the success thereof, or which are essential to success?

A. First, the structure is such as would [583] permit the putting of a large capacity pump in the bore of a well, eliminating the use of the pit.

Mr. TOWNSEND.—Your Honor, that is not an answer to the question, and I move that it be stricken out. He is being asked for the features.

The COURT.—He will come to that, I assume.

A. (Continuing.) And second, the specifications show clearly—

The COURT.—No, that does not quite answer the question. What features of the commercial product that you put on the market do you regard as essential?

A. The features that we have used that are covered by the patent are the enclosed line shaft by the protecting casing, which holds the bearings, and permits the lubricating of the shaft through which the power is transmitted from the earth's surface into the pump. Second, this method of transmission of power eliminates the cutting out of the bearings from the sand that is being pumped.

Mr. LYON.—Q. In other words, Mr. Layne, it is the enclosed line shaft feature—

Mr. TOWNSEND.—Now, one minute: I object to that as leading; let the witness testify.

Mr. LYON.—All right. That is all. I think the Court understands that.

The COURT.—Q. How do you insert or inject

(Testimony of M. E. Layne.)

the lubricant in your commercial type?

A. The commercial type is right there. It is just the same as we do it in the patent; it is just the same as they do.

Mr. TOWNSEND.—I move that that last part of the answer be stricken out.

The COURT.—Yes. Just answer the question. Has that been offered in evidence? [584]

Mr. LYON.—Not yet. We will offer it in evidence. The commercial structure of the plaintiff company is offered in evidence as Plaintiff's Exhibit 8.

The COURT.—This unit that you have offered in evidence does not show where the lubricant is inserted. The head is not here.

Mr. LYON.—No, it is not here.

The COURT.—Q. Where is it inserted—at the head?

A. Yes, at the top. It enters the top in exactly the same manner as the other, and follows the casing, and down into the pump neck.

Mr. LYON.—Q. It is gravity fed?

A. Gravity fed. It is gravity feed wherever only one or two of the pumps are used in series, one pump or two pumps; where there is more than one pump, or generally, where there are more than two, it becomes necessary to put pressure on, as a general thing.

The COURT.—Q. You use ordinary lubricating oil?

A. Yes, any kind of lubricating oil can be used, or clear water, as long as there is no sand or dirt

(Testimony of M. E. Layne.)  
in the lubricant being applied.

Mr. TOWNSEND.—Q. Your whole pump enclosure there within the shaft casing is assumed to be filled with oil, isn't it?

A. No, sir, not necessarily. Where it is working on gravity, and where it is working on vacuum, it just drops down through, but where we are working under a high pressure we usually inject the oil in under a slight pressure.

The COURT.—Q. What becomes of the oil after it works down through the several bearings to the pump?

A. It enters into the water being pumped, in either case.

Q. Through what outlet?

A. In our structure, it enters right through the bottom end of the lower bearing; in their structure it— [585]

Q. I am talking about yours.

A. Just through the bottom bearing. We don't provide any vent; it just comes out in the water.

Mr. TOWNSEND.—You see, your Honor, they admit a stuffing-box in freedom of action.

Mr. LYON.—Q. In regard to the patent in suit, how would the structure, as you have shown it in your drawings, operate in that regard, as to the oil or lubrication system?

Mr. TOWNSEND.—The patent is the best evidence.

The COURT.—I suppose his question is for the purpose of getting his construction and interpretation; you can ask him where he finds such a claim.

(Testimony of M. E. Layne.)

A. It works the same.

Mr. LYON.—Q. You have shown a stuffing-box over 41, Figure 5; with such a stuffing-box around a small rotating drive shaft, what condition of closure could be maintained?

A. Only loose closure.

Q. Please explain to the Court a little more fully what you mean by that.

A. Any packing gland that is sufficiently tight or closed against a shaft so that it absolutely shuts out the flow of lubricant, whether it be water or oil, through the same, usually burns and becomes inoperative; the consequence is we must leave the packing slightly loose, so that a sufficient amount of either water or lubricant passes through the packing gland in quantities so that the same is lubricated.

Q. Then, in your opinion, based upon your experience in the manufacture and sale of these pumps, how does the long sleeve bearing which you use in the place of this stuffing-box, 41, compare with the stuffing-box 41?

A. It performs the same function in identically the same manner.

Q. And as to the degree of closure?

A. In the same manner, only [586] that the metal at that point will permit of greater wear with less looseness.

Q. In other words, the long sleeve bearing will remain to a greater degree of tightness for a longer time than the stuffing-box? A. Yes.

(Testimony of M. E. Layne.)

The COURT.—Q. Why doesn't the water work up through that bearing?

A. In their structure—

Q. No, I mean in your structure.

A. In our structure, it would, if it is under high pressure. As I said, under high pressure we inject our lubricant under pressure to offset that pressure, and so the oil, then, is pressed in under slightly greater pressure than it is where it works on vacuum.

Q. Then you keep your casing full of oil?

A. Yes, it presses it down, where it is working under high pressure. Where it is working under gravity feed, where there are only two or three stages, then it is only gravity, and it drops right down and works out. But where the pressure above the point at which the power is applied is very great, then the gravity feed will not give satisfaction, and we then put the lubricant in in that case under pressure. But where the water is being discharged at the earth's surface and not forced above the surface, that is not necessary.

Q. I don't quite understand that, if the water is being discharged at a point as high as the power is applied.

A. Suppose this floor were an irrigating field, and we simply pumped the water to a level sufficient to run it off in the field, the pressure against which the pump is working is only sufficient to deliver the water on the field. If we wanted to deliver it into tanks for public utility purposes, and use the pump for a double purpose, as a discharge pump and as a

(Testimony of M. E. Layne.)

lift [587] pump, wherever the water is delivered at a greater height than the surface of the ground at which the power is applied, at which the pump neck or discharge tee appears at the surface, in that case the water being boosted would have a tendency to give a greater pressure on the oil closing tube or protecting tube, and in that case we would put the oil under pressure in the tube to offset the booster pump pressure above.

Q. Yes, I understand that, but if you are lifting water that way, I would not think it would be necessary to keep the shaft casing full of oil.

A. It is only necessary to keep the shaft casing filled with oil sufficiently so that the flow of oil is coming out below. That assures both lubrication and protection as long as it works down.

Q. The head of the oil would always have to be higher than the head of the water?

A. Yes, and the reason for that being possible in a centrifugal pump is that the center of all centrifugal pumps is on the vacuum side of the pump. The periphery of the runner is the discharge portion. Therefore, the pressure at the point at which the shaft-protecting tube is connected, being the center of the pump runner, is under less pressure at that point than it is at the periphery of the runner, and consequently, when the pump is in operation the pressure on the discharge side is greater than on the vacuum side, and for that reason the lubricant can gravitate down to the pump through the shaft-enclosing casing; in other words, it makes it possible for a lower pressure to exist in the oil-protecting cas-

(Testimony of L. R. Nash.)

ing than exists in the discharge casing, due to the fact that the vacuum caused the runner.

(A recess was here taken until two o'clock P. M.)  
[588]

**AFTERNOON SESSION.**

Mr. LYON.—Plaintiff offers in evidence as Plaintiff's Exhibit 9, circular of the Western Well Works, Inc., that they use in advertising for sale their pumps, and in that connection, in passing, I call your Honor's particular attention to a statement of the circular that: "As regards lubrication, no stuffing-box glands are necessary in our patent construction. Advantage is taken of the inward water leakage, from discharge column to the shaft bearing, and with the water accumulation is mixed an emulsifying oil of vegetable base. The resultant—a thin lubricant—is fed down the pipe shaft-bearings, finding an outlet at the bottom of the discharge column."

(The circular is marked "Plaintiff's Exhibit 9.")

**Testimony of L. R. Nash, for Plaintiff.**

L. R. NASH, called for the plaintiff, sworn.

Mr. LYON.—Q. You live where, Mr. Nash?

A. San Jose.

Q. You appear here in response to a subpoena?

A. I do.

Q. In what business are you engaged?

A. Machine-shop.

Q. How long have you been in that business?

A. With the Nash-Englehart-Silva Company a little less than eight years.

(Testimony of L. R. Nash.)

Q. How far is your place of business from that of the Western Well Works, Inc.?

A. Next door.

Q. Did you ever do any work for the Western Well Works, Inc., in the manufacture, installation or repair of deep well centrifugal pumps?

A. We manufactured some of them for a while.

Q. How was the first of those manufactured, in so far as the enclosing casing or tube around the drive shaft was concerned?

A. In what way do you mean?

Q. Were they loose or tight at the joints of the enclosing casing? [589]

A. The discharge pipe was screwed into the coupling, and the tube slipped over the hub of the bearing.

Q. There was a slip joint, originally? A. Yes.

Q. Was it loose?

A. Not loose; it was what you would call a slip fit, you put it on by hand.

Q. At any time was that changed?

A. Yes; I don't remember how long we made the ones with the slip joints, but afterwards we made them with a tighter fit on the tubing.

Q. Do you know why?

A. To prevent leakage.

Q. I call your attention to Plaintiff's Exhibit 4, known here as the Anderson pump, and particularly to the joints of the enclosing tubing; that is the tubing that you are referring to as originally having the slip joints—this one around the driving shaft?

A. This part here (pointing).



(Testimony of L. R. Nash.)

Q. Do you know what was the reason for afterwards making those having a tight fit at that connection?

Mr. TOWNSEND.—That is objected to. It is evidently a guess on his part.

Mr. LYON.—Q. Under whose instructions did you make that connection to the driving shaft?

A. Mr. Halstead's.

Q. Mr. Halstead of the Western Well Works?

A. Yes.

Q. Did he give you any reason for doing so, or did you know of any reason at the time?

A. To prevent leakage of the water into the line shaft.

Q. Into the line shaft? A. Yes.

Q. Within the last six weeks or two months have you had occasion to make any extensions or repairs on any of said Western Well Works, Inc., centrifugal pumps at your place?

A. We did not make any extensions, no.

Q. What did you do?

A. We had a job putting the extensions on [590] a pump; Mr. Halstead's firm furnished the extension.

Q. Did you examine that to see whether in that extension the enclosing tube was a tight fit on the hub, or not.

Mr. TOWNSEND.—If your Honor please, it seems to me the examination should be confined to matters occurring before the suit was brought, not something that occurred in the last three or four weeks.

(Testimony of L. R. Nash.)

The COURT.—Overruled.

A. I did not examine it in particular in that line, but I happened to look at the coupling; a tube was slipped on there, and it had a larger size at the neck of the bearing where the tube slips on.

Mr. LYON.—Q. What would such a larger size indicate? A. That it would make a tight fit.

Q. At what portion of the bearing was this larger size?

A. The bottom part; that is, the *male* part of the coupling; the tube slips over down at the shoulder, the bottom of it.

Mr. LYON.—You may take the witness.

Cross-examination.

Mr. TOWNSEND.—Q. When was it you made the first parts for the Western Well Works?

A. Some time in 1915; that is when we started.

Q. These so-called tighter fits that you made subsequently were not such tight fits that under working conditions no water could get in? You would not say it was impossible for any water to get in through that joint? A. Not at first; no.

Q. Were those parts where they telescoped, one to the other, always exactly the same size?

A. No.

Q. Will your pipe section which fits over the hub of the bearing sometimes be larger in one case than in the other?

A. On the [591] straight part; yes.

Q. In reaming down the tapered end of the bearing, will that diameter vary at times? A. Yes.

Q. Your reaming tool, in other words, or your

(Testimony of L. R. Nash.)

lathe tool will cut at slightly different diameters in treating one section and another? A. Yes.

Q. And the same way in treating the cutting down of the tapered ends of the hubs? A. Some.

Q. So that you are not always going to get the same degree of fit with every part that is put together that you do with others?

A. No, not on the taper part; that is the only part that is really tight fit.

Q. But these diameters, both on the inside of the tube and the outside of the taper, vary, you say?

A. That is what the taper is for, to take care of that irregularity.

Q. Are the tubes always of the same length, the tube sections always of the same length? A. No.

Q. And, therefore, would not that taper on the hub assist somewhat in taking care of variations in the length of the tube?

A. The taper takes care of it, because the hole in the end of the tube is straight and has a sharp corner, and it slips over, and that is tight, and then it starts to get a larger diameter, say 1/16th of an inch.

Q. That taper offers compensation for the variation in the length of the two sections? A. Yes.

Q. Likewise, Mr. Nash, I suppose if the tube is removed for repair, occasionally the interior diameter of the tube that slips over the taper will vary at times? A. Yes.

Mr. TOWNSEND.—That is all. [592]

Redirect Examination.

Mr. LYON.—Q. Mr. Nash, you said at first those

(Testimony of L. R. Nash.)

joints were not tight. What do you mean by that?  
Did you mean the first ones that you made?

A. Yes.

Q. Did the first ones have the taper? A. No.

Q. After that you put in the taper to insure the tight joint? A. Yes.

Recross-examination.

Mr. TOWNSEND.—Q. I understood from your statement at first they were tight when they were new and put on there.

A. I meant on our first order of work we did for them; I don't remember how much we did, or how many, but it was for a little while. We first made them with the tube part to slip over by hand, over the hub of the bearing, and that hub was straight, and it did not have the taper at the bottom.

Q. Every time that you slip a tube over its hub section and remove and put it back, each time the part changes its relative diameter? A. Yes.

**Testimony of Henry C. Folsom, for Plaintiff.**

HENRY C. FOLSOM, called for the plaintiff, sworn.

Mr. LYON.—Q. Where do you live, Mr. Folsom?

A. San Jose.

Q. At the present time, what is your occupation?

A. I am in charge of the installing of the Layne & Bowler Corporation.

Q. Were you ever employed by the Western Well Works, Inc., of San Jose, the defendant in this suit?

A. I was.

Q. Doing what?

(Testimony of Henry C. Folsom.)

A. I had charge of the installation of pumps.

Q. Of what pumps?

A. Of the Western Well Works turbine pumps.

Q. About when did you commence that employment with them?

A. About 1916; that is, I was not permanently employed at that [593] time, but I commenced on their work.

Q. At that time, were they putting out a deep well centrifugal pump which had a tube around the drive shaft? A. They were.

Q. Intermediate bearings at the end of each section of the tube? A. Yes.

Q. How were those sections of tube mounted on those first pumps that you installed for them?

A. The end of the tube was reamed straight and slipped over a tapering hub.

Q. Was that joint where it was slipped over tight or loose? A. Tight.

Q. Would the first joint leak or permit water to enter the joints? A. Not those that I examined.

Q. They were all tight? A. Yes.

Q. Do you know the Anderson ranch, I think it is, near Stockton, California? A. I do.

Q. Did you install any of the Western Well Works, Inc. deep well turbine pumps on that ranch?

A. I did.

Q. How many of them? A. Four.

Q. What were the numbers of the wells?

A. Numbers 2, 3 and 4.

Q. How were those sections of the enclosing casing connected on those installations, loose or tight?

(Testimony of Henry C. Folsom.)

A. They were tight.

Q. Would they permit, or would they not permit the entrance of water into the enclosing tube at those joints? A. I would say they would not.

Q. Under whose instructions did you make those installations? A. Mr. Halstead's.

Q. Mr. Halstead, who is one of the defendants in this case? A. Yes.

Q. I show you Plaintiff's Exhibit No. 4, one of the pumps from the Anderson ranch, and call your attention to this white chalk [594] at the bottom of one section of the shaft-enclosing tube. Do you know what that is?

A. I would say it is white lead.

Q. Why would you say it was white lead?

A. Because there was a can of white lead provided with each shipment, provided for that purpose.

Q. In making the installations at the Anderson ranch, did you use white lead at these joints?

A. I did.

Q. For what purpose?

A. I should say for sealing the joints.

Q. Under whose instructions?

A. Under Mr. Halstead's.

Q. What effect has white lead, when so used?

A. It will stop corrosion and act as a seal.

Q. Approximately when were these Anderson ranch installations, to which you have been referring, made?

A. If I remember right it was the forepart of 1917, the ones that I put in.

Q. Did you ever see any of these connecting joints

(Testimony of Henry C. Folsom.)

between the section of the shaft-enclosing tubing and the section which forms the bearing use anything but white lead?   A. No.

Q. Haven't you used any gasket, or any other kind of element?

A. I never did but on one occasion, one old pump that I pulled up.

Q. What was the occasion of that?

A. I suppose the gasket was in there to seal it.

Q. Whose pump was it?

A. It was the Segar pump, at Mountain View.

Q. Of whose manufacture?

A. The Western Well Works.

Q. Did you ever have any occasion to pull any of the other installations of the Western Well Works, Inc., than this one?   A. I did.

Q. Did you have occasion to so pull such installations on account of leakage into the shaft-enclosing casing?   A. I did.

Q. Please explain fully what you mean in that connection, and where and when? [595]

A. There was one on the Nielsen ranch, or Prospect Road, and another one on the Jepsen ranch, on Prospect Road; there was water leakage through the tube, and we pulled the tube and put tight tubes on it.

Q. Under what circumstances did you do that work? What was the reason for it, and for whom?

A. I did it under the instructions of the Western Well Works as repair work; there was trouble with the water coming up around the shaft.

Q. What was the result of the water coming up around the top of the shaft?

(Testimony of Henry C. Folsom.)

A. To prevent any lubricating oil from going down.

Q. What was the object in making this joint tight?

A. To keep the water that was coming up in the column out.

Q. Keep the water out of the enclosing casing, was it? A. Yes.

Q. You have mentioned two such installations, in which you have pulled the Western Well Works, Inc., pumps. Any other that you remember?

A. The Prattville Cannery at Santa Clara; I changed the bearings there; that is the hub, or the tube, I should say.

Q. Did you change them in order to make them tight at the joint? A. Yes.

Q. And to prevent water getting into the enclosing casing? A. Yes.

Mr. TOWNSEND.—I object to that as leading.

Mr. LYON.—What was the object?

A. To prevent the water from going into the tube.

Q. How about the Stockton Water Company, at Stockton; did you pull one of the pumps there?

A. I did.

Q. For the Western Well Works? A. Yes.

Q. What did you do there, and for what purpose?

A. I changed all of the hubs, that is, all of the combination couplings, in [596] order to get hubs that were tight.

Q. Did you use white lead in any of those that you replaced? A. All of them.

Q. I think you said that was the written instructions for installation as furnished to you by the Western Well Works? A. Not written.



(Testimony of Henry C. Folsom.)

Q. Oral?     A. Oral.

Q. From whom did you receive such instructions?

A. From Mr. Halstead.

Q. You referred to removing and repairing a pump at the Stockton Water Company. Was there more than one installation that you so removed there?

A. One.

Q. Just one?     A. One.

Q. Will you look at this Plaintiff's Exhibit 4 and state if you can identify it as the pump that you put in?

A. I would say that was the pump, or an exact duplicate of it.

Mr. LYON.—That is all.

Cross-examination.

Mr. TOWNSEND.—Q. You are related, I believe, to one of the defendants in this case, are you not?

A. Not what you would call a relation.

Q. You are a brother-in-law of Mr. Vaughan?

A. Through marriage, yes.

Q. And your relations with the defendant has not been entirely amicable?     A. Not that I know of.

Q. You left the employ of the Western Well Works, did you not, on the invitation of the Western Well Works?     A. I did.

Q. You sought to give the impression that the use of white lead at the joint formed by the slipping over of the section of the tube, shaft tube over the hub, was for the purpose of forming [597] a tight joint, and sought to give the impression that the use of white lead was not generally employed. As a matter of fact, in all of the installations, didn't you al-

(Testimony of Henry C. Folsom.)

ways use the white lead?     A. I did.

Q. And didn't you use white lead for the purpose that you have incidentally mentioned, to prevent the corrosion of the two iron parts coming together? Wasn't that the purpose of the use of the White Lead, to keep those parts from rusting when the water encountered it?

A. That and sealing it also, was my impression.

Q. Your impression; I am not asking your impression, but I am asking for the fact, as to whether the white lead put between the two metal parts that fitted loosely would prevent corrosion?     A. Yes.

Q. And preventing corrosion would prevent the parts freezing together?

A. I do not get your question.

Q. The white lead between the two metal parts in close contact will prevent those two metal parts freezing together?     A. Yes.

Q. Most of those bearings are submerged, are they not, or in the water the greater part of the time?

A. They are.

Q. Those bearings are always under the water during the operation of the pump, are they not?

Mr. LYON.—We object to that question. The witness has not referred to any bearings removed. Counsel means the connection. We would like to have him specify it.

Mr. TOWNSEND.—The connections, I should say—the connection of your tube with the bearing of the hub—those are always under water, are they not?

A. When the pump is in operation.

(Testimony of Henry C. Folsom.)

Q. And continuously in operation?      A. Yes.  
[598]

Q. You know that white lead does not dry when under water—you know that?

A. I never noticed that in particular.

Q. You know that it will harden on its exposure to the atmosphere?      A. Yes.

Q. So if these joints are moistened with white lead under water they do not dry out, do they?      A. No.

Q. Now, do you know anything about the action of the rotating shaft on this loose-fitting sleeves or tight-fitting joints, or whatever you want to call them, with white lead in between? Is there ever any motion, due to the shaft, between those telescoping parts?

A. I would not say there was, unless the pump was vibrating.

Q. If your pump is driving, isn't there always some vibration?

A. That I would not say, they are always, because they are down where you cannot see them.

Q. Don't you know that shaft always has some vibration?      A. That I don't know.

Q. Haven't you stated that you have installed a great many of these pumps in the wells?      A. Yes.

Q. Have you ever seen them work?      A. Yes.

Q. Did you ever notice the operation of them?

A. Not below the surface.

Q. I am not talking about below the surface. You have seen them operate and know the conditions under which they operate, do you not?      A. Yes.

Q. Don't you know that that shaft would have a tendency, working through the bearings, to keep the

(Testimony of Henry C. Folsom.)

joint and the bearing member which fits up into the tube section, in slight movement? I am just asking you now as a fair question.

A. That I would not say, one way or the other; that is, I am not prepared to say [599] on that.

Q. You are not prepared to deny the truth of my statement? A. I would not say to that.

Q. But, assuming there is such slight movement, what would you say in regard to the entry of water between the two members of the tube section fitting over the hub, as to the entry of water at some point along that line?

Mr. LYON.—We object to that question on the ground that it is entirely hypothetical, and not in accordance with the construction the witness has testified to, and it is assuming to ask the witness for hypothetical expert testimony, when the witness has been examined solely as to a question of fact, that is, the actual mechanical construction.

The COURT.—Sustained.

Mr. TOWNSEND.—We are not going to argue the objection, but he has testified to a tight joint, and I want to see if, with his knowledge, he would not admit that such movement, which I think is obvious to the Court, will be such as to admit water. I will pass it.

Q. You stated that you pulled the Nielsen and Jepsen pumps and you stated the purpose was for tightening the joints. A. Yes.

Q. Was there any other purpose that you drew that pump for? A. Not at that time.

Q. Didn't you draw those pumps for the purpose

(Testimony of Henry C. Folsom.)

of taking out the old bearing and put in the spiral groove bearing?

A. That was after that was done, when it was replaced with these.

Q. You pulled it again?

A. I pulled it the second time; it leaked after the first replacement was made.

Q. You did pull it one time and take out the smooth bearings and introduced the spiral bearings?

A. Yes. [600]

Q. What was the purpose of those spiral groove bearings?

A. As it was explained to me, they would conduct the oil down the shaft.

Q. The oil? A. The lubrication.

Q. What was the lubrication employed?

A. At that time it was a common oil, that is, the common, ordinary lubricating oil.

Q. Will you name the brand of any common oil that they used at that time?

A. They used Zerolene at that time.

Q. Do you mean that they used Zerolene or common oil exclusively for lubrication?

A. They did at that time.

Q. What time was that?

A. That was about two years ago.

Q. Two years ago would be 1918?

A. Somewhere about that time.

Q. Now, give us about the year?

A. I could not give you the exact date.

Q. What season of the year was it?

(Testimony of Henry C. Folsom.)

A. Some time around—I could not give the exact date.

Q. *What season of the year was it?*

A. *Some time around—I could not give the exact date.*

Q. You say it was two years ago.

A. Approximately two years.

Q. When they pulled the pump and put in the spiral grooved bearings?

A. I think that was it.

Q. And that they were using zerolene at that time?

A. I believe they were.

Q. Do you know?      A. Yes.

Q. How was that zerolene applied to the bearings, in what method?      A. By a drop oiler from the top.

Q. Gravity feed?      A. Gravity feed.

Q. What was the use of those spiral grooved bearings?

A. To conduct that lubrication down the shaft.

Q. Was there nothing mixed with that oil?

A. Not at that time. [601]

Q. What other method of lubrication then, or at any other time, has the Western Well Works employed, to your knowledge?

A. Later they used an emulsifying oil.

Q. Explain the operation of the use of the emulsifying oil?

A. It was employed the same way, dropping the oil.

Q. What was the idea of emulsifying oil, rather than a common lubricant, like zerolene?

A. So that it would mix with the water when it came in contact with any water.

(Testimony of Henry C. Folsom.)

Q. Where would it come in contact with water?

A. Wherever the water happened to be down in the tube line.

Q. Down in the tube line?      A. Yes.

Q. That water in the tube line came in through these loose joints, didn't it?

A. I would not say that it did.

Q. You would not say that it did not, either, would you?

A. My impression was that any water that came up in there came through the drain tube below.

Q. Came through the drain tube below?

A. Yes.

Q. How would that water get up from the drain tube below past the spiral grooved bearing?

A. I don't know that it came up past the spiral grooved bearing; I would not say as to where that emulsifying oil met the water; that took place inside the tube.

Q. You are testifying that there was an emulsion formed in the tube line.

A. At some point where the emulsifying oil came in contact with the water.

Q. Did you ever take a pump down after the emulsifying oil was employed?      A. Yes.

Q. What did the interior indications point to you as being the condition as to whether there had been oil in there, or an emulsion in there?

A. When we took it apart the oil ran [602] out. You could not tell what was in there.

Q. The oil ran out?

A. The oil ran out at the bottom of the tube.

(Testimony of Henry C. Folsom.)

Q. You say "oil." A. Oil, or lubricant.

Q. You mean lubricant, do you not?

A. Whatever lubricant was used.

Q. As a matter of fact, you know very well that no sufficient quantity of oil was ever used to entirely fill that shaft tube?

A. I would not say as to how much went in there, it was dripping constantly.

Q. Don't you know, as a matter of fact, the talking point was the emulsion factor?

Mr. LYON.—We object to that as immaterial, what the talking point was.

The COURT.—Sustained.

Mr. TOWNSEND.—Do you know of your own knowledge what the action of the spiral groove would be?

A. I never saw one under operation, that is, where you could see what the action would be.

Q. Do you know what that casting is?

A. We would term that a combination coupling of the Western Well Works.

Q. That has spiral grooves, has it not?

A. It has.

Q. It is such a coupling as you put into the Jepson and Nielsen pumps? A. Yes.

Q. Did you put such a coupling into the Stockton pump? A. I did.

Q. And you recognize that casting as the stock coupling for the last several years of the Western Well Works?

A. The general appearance; I would not say it is exact; it has the general appearance of it.



(Testimony of Henry C. Folsom.)

Mr. TOWNSEND.—I will ask that this be marked “Defendant’s Exhibit ‘C’ for Identification.” [603]

(The casting was marked “Defendants’ Exhibit ‘C’ for Identification.”)

Q. You referred to the Stockton pump. What were the conditions of operation of that pump, if you know? A. In what way?

Q. How deep was the pump in the well?

A. Somewhere around 40 feet, I think; I would not say its exact depth, but about that.

Q. What was the water level?

A. It was less than 40 feet; I have not any data with regard to the exact level.

Q. What height was it pumping water above the pump head?

A. It went up as high as 60 pounds—from 40 to 60 pounds pressure.

Q. It was pumping considerably above the surface? A. Yes.

Q. Pumping under high pressure? A. Yes.

Q. What was the condition that you found there, that you were confronted with?

A. The water came out through the shaft in a small stream.

Q. Around the shaft; you mean out through the drain pipe?

A. Out through the top bearing—what they term their top bearing.

Q. In other words, the drain pipes were not of sufficient area to take care of the leakage water that was coming into the shaft tubing?

A. I presume that was in through the shaft tubing.

(Testimony of Henry C. Folsom.)

Q. It was coming into the shaft tubing from the discharge column?

A. It was my impression it was coming through the top bearing of the pump.

Q. I am not asking for your impression, I am asking for the fact, if you had more water in the shaft tube than your drain tubes would take care of.

A. Yes.

Q. That was coming in somewhere from the well?

A. Yes.

Q. As a result, there was so much more water in that tube, and [604] the pressure was so great, that it came out around the bearings at the top of the pump? A. Yes.

Q. What did you do to try to overcome that?

A. I changed the bearings.

Q. You put in there the spiral grooved bearings, like Defendants' Exhibit "C" for identification?

A. The original one was a spiral bearing; I put in one with a tighter hub.

Q. But you found your spiral grooved bearing would not even then take care of the water?

A. No.

Q. You still had an excess of leakage water?

A. Yes.

Q. Were you ever able to satisfactorily meet that situation and overcome the difficulty of an excess of leakage water into the shaft tubing?

A. Not while I was on the job.

Q. When you pulled a pump, Mr. Folsom, and wanted to make some repairs on it, did you have any difficulty, or much difficulty in tubes loose from

(Testimony of Henry C. Folsom.)

the hub? A. I have at times.

Q. And other times, what has been your experience? They come right off by hand, don't they? A. You usually have to twist them off.

Q. But you usually can take off a tube suction from its hub by hand? A. Very seldom.

Q. But you have done that? A. I have done it.

Q. You have done it frequently?

A. No, not frequently.

Q. Occasionally you find one that is stuck?

A. More often you find them stuck than loose.

Q. That depends particularly, does it not, on whether the pump has stood idle for a long while.

A. I never noticed any difference between the two.

Q. You are not able to answer that question definitely, whether the standing of the pump idle for a long time and the water low [605] in the well makes any difference?

A. I would not be prepared to answer on that.

Q. I understood you to say you pulled the Nielsen pump.

A. Yes. That is, I had charge of the pulling of it; I did not actually do the work myself.

Q. After you say you tightened the connections you put it back again? A. Yes.

Q. You made reference to a Segar pump. You know, I suppose, that was the very first pump that the defendants manufactured?

A. I believe it was; that is, one of the first. I would not say it was the first.

Q. One of the first? A. Among the first.

(Testimony of Henry C. Folsom.)

Q. It was originally installed away back in 1915, was it not? A. I believe it was.

Q. When you put back the Nielsen pump, did you replace it with a new tube?

A. I believe there was some new tube where the original one was loose.

Q. Did you replace it with new bearings?

A. I would not say whether new bearings were put in it or not. I do not remember definitely.

Mr. TOWNSEND.—That is all.

Redirect Examination.

Mr. LYON.—Q. In these pumps as they were originally assembled to be put into the well, I mean by that the Western Well Works, Inc., pumps, that you have been speaking about, did they use any heavy grease in connection with them at all?

A. When I went there they did.

Q. In what way?

A. We packed all the inside of each tube, that is, filled the space between the tube and the shaft.

Q. The shaft-enclosing tube is the one that you refer to? A. Yes. [606]

Recross-examination.

Mr. TOWNSEND.—Q. In packing these bearings with this grease, what would be the action of the spiral groove when the pump was started in rotation?

The COURT.—He said he packed the tubes.

Mr. TOWNSEND.—Am I to understand you to say you packed the tube with grease? A. Yes.

Q. How much did you put in, say, in a 3-inch

(Testimony of Henry C. Folsom.)

tubing, and 100 feet long?

A. We usually only packed the grease around the shaft before we slipped the tube down; we used, generally, about 30 inches on a tube, all we could make stick on, adhere to the shaft, and then we slipped the tube over.

Q. I do not quite understand you.

A. We used heavy grease.

Q. You greased the tube first? Is that right?

A. No.

Q. I mean, you greased the shaft first?

A. We packed the heavy grease on the shaft and then slipped the tube down over it.

The COURT.—What length of shaft?

A. I should say about 30 inches.

Q. At the top, or bottom?

A. At the bottom of each section of the shaft.

Q. You mean 30 inches of each section?

A. 30 inches of each section.

Mr. LYON.—This was a 5-foot 6-inch shaft?

A. 6 foot 8.

Mr. TOWNSEND.—Q. That application of grease around the shaft for 30 inches was to allow the shaft to slip easily into the bearing, was it not?

A. The shaft was already in the bearing. [607]

**Testimony of S. N. Hall, for Plaintiff.**

S. N. HALL, called for the plaintiff, sworn.

Mr. LYON.—Q. Where do you reside, Mr. Hall?

A. Los Angeles.

Q. You are employed by the Layne & Bowler Corporation? A. Yes.

(Testimony of S. N. Hall.)

Q. At any time did you go to the Anderson ranch near Stockton? A. Yes.

Q. I show you Plaintiff's Exhibit 4 here on the floor; did you ever see it before? A. I did.

Q. When did you first see it?

A. I saw that as it was assembled in the pump on May 19, 1919.

Q. Where?

A. On the Anderson & Barngrover ranch near Stockton.

Q. Under what circumstances did you see it at that time?

A. It was assembled in the pump as we pulled it from the well.

Q. When you say "we," who was "we"?

A. Carlson and a couple of helpers of Anderson & Barngrover employees.

Q. What was the purpose of pulling that pump out?

A. The purpose was to get a specimen of the pump being put out by the Western Well Works.

Q. Now, what did you do as you pulled this pump from the well?

A. We first built an extra-high derrick—

The COURT.—Is that material, how he did it?

Mr. LYON.—I want to show a test that was made right there on the ground, your Honor.

The COURT.—Show the test, but how he pulled it is not material.

Mr. LYON.—Q. You had a high derrick. Do

(Testimony of S. N. Hall.)

you know what these two photographs are that I hand you?

A. Yes. They are photographs of the pump as we pulled it up through this derrick and shot the upper end of the pump with the head through the top of the derrick, and then rested the pump on the surface of the ground. [608]

Q. Those were taken at the time?

A. Those two were.

Mr. LYON.—We offer these in evidence and ask that they be marked.

Mr. TOWNSEND.—Objected to as immaterial and irrelevant.

The COURT.—The objection is overruled.

(The photographs were marked "Plaintiff's Exhibit 10" and "Plaintiff's Exhibit 11.")

Mr. LYON.—I show you another photograph. Do you know what that is? Is that a part of that same test that was made?

A. No, this does not refer to the test that we had then.

Q. This one?

A. Yes, this is a part of the test that we gave it at that time.

Q. What does this show?

A. It shows where the water is squirting from under the lower end of the discharge column.

Q. What is this white spot here?

A. The purpose in making that test was to detect or discern whether the water would leak through the by-passes coming from the shaft bearing to the outside of the discharge column.

(Testimony of S. N. Hall.)

Q. What is the point which I now call your attention to right there?

A. It is the by-passes or conduits leading from the shaft casing.

Q. When you had this Anderson pump standing up on the derrick, as in the two photographs you have identified, what did you do? Describe what you did?

A. We placed the lower end—we removed the pump bowls and then we fixed a stopper, a plug, that was driven about  $1\frac{1}{2}$  inches in the lower end of the bearing which screws onto the upper pump bowl and lower end of the shaft casing, in order to prevent the water from coming into the lower end of the shaft casing through the shaft bearing; then we placed the weight of the entire discharge column, including the pump head, [609] on a smooth board, so as to form a water-tight joint; then we filled the discharge column full of water to running over.

Q. How many feet of discharge column was there in that test?

A. There was about between 36 and 40 feet, I suppose; we never measured it up definitely.

Q. Now, what did such test demonstrate to you?

A. The test demonstrated that there was no water passing into the shaft casing.

Q. What demonstrated that to you, Mr. Hall?

A. From the fact that while the discharge column was under this pressure of water, being filled to the top, the water would not come into the shaft casing and then escape through the by-passes or conduits



(Testimony of S. N. Hall.)  
just above the pump bowl.

Q. The point that I call your attention to is an opening of one of these by-passes or drains?

A. Yes.

Mr. LYON.—We offer the photograph last referred to in evidence and ask that it be marked "Plaintiff's Exhibit 12." Your Honor will see that there was no water in that photograph coming out of that drain.

(The photograph was marked "Plaintiff's Exhibit 12.")

Q. I show you another photograph and ask you if you know what that is?

A. That is the disassembled pump from a second well we pulled on the Anderson & Barngrover ranch.

Q. Is that also a Western Well Works, Inc., installation? A. It is.

Q. Now, on these pieces of shafting up here there seems to be something sticking. What is that?

A. It was heavy cup grease.

Q. And that was in this pump when you pulled it? A. It was.

Mr. LYON.—We offer this in evidence and ask that it be marked "Plaintiff's Exhibit 13."

(The photograph was marked "Plaintiff's Exhibit 13.") [610]

Q. Now, after making this test in the derrick, what did you do with this Western Well Works, Inc., pump?

A. We took it down and then we put it in storage with the Stockton Transfer & Storage Company,

(Testimony of S. N. Hall.)

and then it was shipped in a few days to Los Angeles.

Q. What was done with it there?

A. We then first cut out a section of one of the discharge columns.

Q. Did you cut it as it is here exhibited in Plaintiff's Exhibit 4? A. We did.

Q. Did you make any test of any other portion of that assembly?

A. Yes. We assembled a section of the discharge column having a combination coupling bearing on each end and then we made a screw threaded plug having a central bore passing around the projecting hub of the bearing, which had a packing gland, which we packed.

Q. What was the purpose of that?

A. In order to fill the section with water, and put it under hydraulic pressure, to ascertain whether the water would then enter the section of the shaft casing.

Q. What did such test disclose?

A. It disclosed the fact that the water could not pass through the end connections around the hub of the bearings.

Q. When you say end connections of the hub, do you mean the connections at the end of the section of the shaft-enclosing casing?

A. Between the outside diameter of the hub and the inside diameter of the shaft casing.

Q. It could not get in at that point to the shaft-enclosing casing? A. It could not.

(Testimony of S. N. Hall.)

Q. How much pressure did you use, do you remember, in that test?

A. I first ran it up to something like 90 pounds, but the discharge [611] pipe would not hold externally; we had to take the couplings off and fill them with a composition and put them back; then we were afraid to run the pressure up higher than something about 50 pounds, as I remember it.

Q. When you say the discharge pipe connections, you mean where the discharge pipe is screwed into this connector section that we are speaking of?

A. Yes.

Q. At that point, when you got that 90 pounds pressure it leaked? A. It leaked.

Q. I show you a photograph. Was that photograph taken during the last test? A. Yes.

Q. Is that apparatus which we have marked Apparatus No. 6 the apparatus that you used in that test? A. Yes.

Mr. LYON.—I offer the photograph last referred to in evidence; it is the same test, but it shows the end connection.

(The photograph was marked "Plaintiff's Exhibit 14.")

Q. Now, the joints were in the same condition during this test as they were when you first removed them from the well? A. They were.

Q. No changes of any kind had been made by you? A. None at all.

Q. Have there been any changes made in these hub connections, or the ends of the shaft-enclosing sections in Plaintiff's Exhibit 4 since it has been re-

(Testimony of S. N. Hall.)

moved from the Anderson well?

A. There has been no change, other than the cutting out of the pipe, as you see it.

Q. In other words, simply the removal of the metal which has been removed there? A. Yes.

Q. Otherwise, it is in the same condition as when it first came out of the Anderson well? A. Yes.

Q. Do you know what these two photographs are?

A. They are [612] photographs of the section referred to, except they show one of the pump bowls below the section.

Q. In other words, it would be like Exhibit No. 4, except the first pump bowl is shown in place?

A. It is.

Q. There are two photographs of that exhibit?

A. There are.

Mr. LYON.—We will offer these in evidence so that your Honor may have them.

Q. You have said that after you applied this 90 pounds pressure pipe you applied a composition. Where did you apply that composition?

A. I applied it in the thread of the discharge pipe.

Q. The discharge pipe?

A. And in the fan holes and threads of the combination couplings.

Q. Did you put any on the connection between the hub and the ends of the shaft-enclosing casing?

A. We did not.

Q. Or any other part? A. No.

Q. Now, Mr. Hall, referring to Plaintiff's Exhibit No. 4, there is a white substance here that has

(Testimony of S. N. Hall.)

been identified as white lead. When did you first see that in that particular exhibit?

A. Well, I first saw it when we disassembled the pump on the Anderson-Barngrover ranch.

Q. It was actually white-leaded at these joints at that time, was it? A. It was.

Q. How did that white lead compare with the composition which you afterwards used to prevent leakage in the water-discharge column, do you know?

A. The combination that I applied was a compound that they ordinarily use for sealing the threads in assembling pipe.

Q. You usually use white lead or red lead for that purpose?

A. No. This was a different composition, I don't remember the [613] name of it now. It is shown on the section of the discharge column that is shown in the photograph under hydraulic pressure.

Mr. LYON.—You may cross-examine.

Cross-examination.

Mr. TOWNSEND.—Q. Referring to the photograph, Plaintiff's Exhibit 14, I note the date on here, "Photograph taken October 1, 1919, operator N. B. Moss, Photo by Stagg": Is that the date the tests were made?

A. I don't remember the date, but it was sometime about that date.

Q. That photograph was presumably taken concurrently with the making of that Los Angeles test: Is that not true? A. Yes.

Q. You say you had pulled this same pump out

(Testimony of S. N. Hall.)

of the well in May, 1919?     A. Yes.

Q. Had it been in the water in the meantime?

A. Well, I did not see the water.

Q. Until you injected water under pressure into the discharge section? In other words, this had been out of the well?

A. It had been out of the well.

Q. And out of use during all of these months, from the time you pulled it until the time you took this photograph in October, 1919?

A. We were a day or two getting it ready for making tests before that time.

Q. When you made your tests on the Anderson-Barngrover ranch that you have testified to, where you pulled the pump out of the well and stood it with the head projecting high above the bearing, did you in that test operate the shaft?     A. No.

Q. The pump was not tested under operating conditions then, was it?

A. No; the pump bowls were removed.

Q. Wasn't that pump of the Defendant's, Plaintiff's Exhibit No. 4, in the plaintiff's laboratory undergoing certain tests between [614] the time you pulled it in May, 1919 and the time you took these photographs and made this test in Los Angeles in October, 1919?

A. I don't understand the question.

Q. Read the question.

(The last question repeated by reporter.)

A. It was there a part of the time.

Mr. LYON.—Q. Was it undergoing tests? That is the question.

A. It underwent tests during that time. It was

(Testimony of S. N. Hall.)

not undergoing tests all the time.

Mr. TOWNSEND.—Q. After these laboratory tests you made this test for pressure on the tube line: Is that right? A. Yes.

Mr. TOWNSEND.—That is all.

Mr. LYON.—That is all. If your Honor please, we have one witness, a Mr. Anderson, whom we wish to ask whether this pump was in the same condition when it was installed as when we pulled it up; in other words, that is all the testimony we wish of him. we are unable to produce him now, and we would like to close our testimony, reserving the right to put in his testimony when he is available. We were in touch with him last night, but he has failed to show up. With that reservation, we close our opening case.

Mr. TOWNSEND.—We are not to be understood as stipulating it was in the same condition as when installed, because we have any knowledge of that.

The COURT.—He is merely reserving the right to call the witness when he comes.

Mr. TOWNSEND.—I offer on behalf of the Defendant a certified copy of the file-wrapper and contents of the Layne patent in suit, and ask that it be marked Defendants' Exhibit "D."

Mr. LYON.—We object to that on the ground that the defendant [615] is estopped by the contract of October 1, 1914, from contending that the claims of the Layne patent in suit have any other, different or restricted meaning than as in said contract set forth. And if offered for the purpose of attacking the validity of the patent, on the ground

they are estopped from contesting the question of validity.

The COURT.—I think I shall let it go in subject to the objection. I will consider these matters together.

Mr. LYON.—And subject to a reserved exception to whatever ruling may be made?

The COURT.—Yes.

(The documents were marked Defendants' Exhibit "D.")

Mr. TOWNSEND.—I next offer as Defendants' Exhibit "E," a certified copy of the Judge Jack decision in the Getty case. It does not happen to be reported, but as a copy of the record in the Getty case I would like to have it before the court.

Mr. LYON.—Of course, that is subject to the last objection made, and it is also objected to on the ground it is immaterial and irrelevant, and upon the ground that it is superseded by the decision of the Circuit Court of Appeals in that case. Judge Jack was reversed in his decision.

The COURT.—I suppose it was merely for my convenience.

Mr. LYON.—Really, I suppose that the opinions of all of the courts in all of the prior litigation may be referred to by the court to see what was before them, and the records in such cases may be referred to in order to ascertain what was before the Court, but it is not proper to offer the opinions or the records in evidence. They are solely, under the practice, referable to by the Court, in order to ascertain what was passed on by the trial court. It



is understood that they [616] may be considered by the Court for that purpose.

(The document was marked Defendants' Exhibit "E.")

Mr. TOWNSEND.—I next offer a certified copy of an exhibit in the Getty case, showing a series of construction which was before the court, some infringing and some noninfringing, and ask that that be marked Defendants' Exhibit "F."

Mr. LYON.—We object to this on all of the same grounds and on the special ground it is incompetent, and no foundation laid. It is a fragmentary showing, anyway.

The COURT.—Sustained.

Mr. TOWNSEND.—I offer as Defendants' Exhibit "F" a copy of the Eisler Patent, No. 522,518, dated July 3, 1894, for a rotary pump, for the purpose of anticipation and showing the state of the art.

Mr. LYON.—All of this prior art will be subject to the same objection, without the necessity of repeating it?

The Court.—Yes.

(The document was marked Defendants' Exhibit "F.")

Mr. TOWNSEND.—I next offer as Defendants' Exhibit "G" copy of the Crannell patent, No. 425,933, dated April 5, 1890, for a compound pump, which patent was referred to in the decision of the Court in the Getty case, and I believe in the Van Ness case.

(The document was marked Defendants' Exhibit "G.")

Mr. LYON.—The Eisler patent was also before the court in those cases.

Mr. TOWNSEND.—It was apparently not considered by the court.

Mr. LYON.—It was not referred to by the Court. I thought it might save Judge Dietrich some labor by stating what was new and what not new. [617]

Mr. TOWNSEND.—I think the Eisler patent is to be considered as entirely new evidence, as we will present it in perhaps an aspect not before brought to the attention of any court in the construction of the Layne patent in suit.

I offer next as Defendants' Exhibit "H" a copy of the Northham patent, No. 633,474, dated September 19, 1899, for a rotary pump.

(The document was marked "Defendants' Exhibit 'H'.")

I offer as Defendants' Exhibit "I" a copy of the Farwell patent No. 691,123, dated January 14, 1902, for pumping and dredging apparatus.

(The document was marked "Defendants' Exhibit 'I'.")

I offer a copy of British patent 24,430, of 1894, to William Matther, apparatus for pump well bores, and ask that it be marked Defendants' Exhibit "J."

(The document was marked "Defendants' Exhibit 'J'.")

I offer British patent No. 12,886, of 1885, issued to Vojaceks, as Defendants' Exhibit "K."

(The document was marked "Defendants' Exhibit 'K'.")

I offer British patent No. 2774, of 1860, to David

Thomson, as Defendants' Exhibit "L."

(The document was marked "Defendants' Exhibit 'L'.")

I offer patent No. 705,844, dated July 29, 1902, to E. M. Ivens, deceased, for pump mechanism, and ask that it be marked Defendants' Exhibit "M."

(The document was marked "Defendants' Exhibit 'M'.")

Not waiving any of our objections to the admission of the contract to which reference has been made, and which has been produced as plaintiff's exhibit, I offer copies of the contracts of March 24, 1915, between Layne & Bowler Corporation, and [618] S. M. Halstead, second part, as Defendants' Exhibit "N," calling particular attention to the paragraph at the end, reading as follows:

"The second party hereby releases and grants back to the first party all his rights, title and interest in that certain contract October 1, 1914, between the Layne & Bowler Corporation and S. M. Halstead and P. E. Vaughan; and in consideration of the premises, the first party hereby agrees not to charge any of the second party's account with any transactions which may be hereafter had under the said contract."

(The document was marked "Defendants' Exhibit 'N'.")

I offer as Defendants' Exhibit "O," and subject, of course, to the previous objection, without waiving any of our rights in the premises, a copy of the subsequent contract of September 19, 1916, between the Western Well Works, Inc., as the first party,

and the Layne & Bowler Corporation as the second party, and call attention to the last paragraph of that contract, wherein it says:

“The party of the first part agrees to dismiss the suits now brought at Salinas against the second party, and both parties hereto agree to relinquish any claim for damage or liability, which either party may have, the one against the other, arising out of such transaction.”

(The document was marked “Defendants’ Exhibit ‘O.’”)

Mr. LYON.—In view of the offer of exhibits “X” and “O,” plaintiff objects on the ground that the same are incompetent, irrelevant and immaterial; the objection of incompetency is not because they are not the original instruments; we admit they are true copies, subject to correction, the same as our contract of October 1, 1914, but in the first place, one of these contracts does not purport to [619] be and was not signed and made on behalf of Halstead and Vaughan, but only Halstead; in the second place, they in no manner, in or under their terms or conditions refer to or set aside paragraph VII of the contract of October 1, 1914, nor do they in any manner affect the covenant of the validity or of the scope of the patent. They simply are a reversion of certain rights, and the settlement of another lawsuit; if your Honor will look at these two contracts, I think you will find that they are totally irrelevant and simply needlessly encumbering the record in this case.

The COURT.—They may go in.

Mr. LYON.—We ask for an exception.

Mr. TOWNSEND.—Certain depositions, your Honor, have been taken *de bene esse* on behalf of the defendants. The depositions are, first, that of Mr. Frank H. Jackson, and that of Mr. Robb, both now located in Los Angeles, but formerly connected with the Byron Jackson Iron Works, of this city; and in order to shorten the record and relieve us of the reading of the depositions, we have reduced them to narrative form, which is the manner of presentation that Judge Van Fleet has frequently followed; of course, the reading may be subject to any objection plaintiff may make. There are certain other depositions taken in matters in Wisconsin, given by Mr. D. W. Mead, a professor of hydraulic engineering in the University of Wisconsin, one of the noted authorities in hydraulics in this country, and also the deposition of Mr. J. W. Alvord. These depositions have been reduced to narrative form, and Mr. Loftus will read it.

Mr. LYON.—We object to any such procedure upon the ground that the depositions were taken *de bene esse*, and we have not been served with any purported narrative form to which they [620] have been reduced, and it is not proper procedure. I do not think that there is any absolute necessity of counsel taking the time, even, to read the original depositions. I do not think the Court is going to be able to decide this case at the close of the hearing, and if the Court is going to take it under advisement, it will probably be able to read such portions as counsel desires to refer to; and, furthermore, our objec-

tions to certain portions of the depositions should not simply be run over by counsel purporting to make a narrative statement of them. Of course, the depositions, themselves, are subject to this same objection in regard to estoppel and the contract. I want to call the Court's attention to that, so that it will not be misunderstood.

Mr. TOWNSEND.—I think these depositions would enlighten the Court in regard to various matters, and I think defendant should be heard in the orderly progress of the trial, and the defendant ought not be estopped from a full presentation in order to give your Honor every opportunity to reach a conclusion at the end of the trial.

Mr. LYON.—I certainly object to counsel reading something that we have never seen. It is a novel procedure to me. A deposition taken *de bene esse* is not evidence until it is read in evidence, and I offer to stipulate it may be considered as read. I certainly object to any condensation that I know nothing about. I cannot listen to anything and accept it that way. Two-thirds or one-half of Mead's deposition is the quotation of letters upon which we rely to defeat the very defense that they assert. I have defeated that defense in Los Angeles on that very subject. It is for that reason, I say, we ought not to have an emasculated presentation. Let us consider the whole [621] thing as read, and let us refer to such things as we desire in the argument. I think it ought to be done one way or the other.

The COURT.—I think that is true, unless you

want to state at the present time in a general way the substance of the depositions, so as to give me the point of your testimony. I would listen to that, but it would have to be short and in simply a general way a sketch of the testimony.

Mr. TOWNSEND.—This is in order to save time. We will quote here and there from the depositions as we go along, and I do not think it will take very long. We ought to finish this in a couple of hours, at the most.

The COURT.—Are you through with the other testimony?

Mr. TOWNSEND.—No; I wanted to present this first, because some of our other testimony will bear upon this. I would like to dispose of the inert matter, as it were, before I come to the witnesses' testimony. It won't take so very long, your Honor, and I think we can present the salient features in a short time. I think we ought to be heard in regard to what our testimony is.

The COURT.—Oh, yes; if you desire to put this matter before me, you may read it now. Of course, as I say, I will simply take a general statement from you, but if counsel objects I cannot permit you to read it in narrative form.

Mr. LYON.—I have no objection to their making a statement of what they contend, so that they can go ahead with their case, if it will be considered that the Court will refer to the actual depositions.

The COURT.—Yes. Of course, I could read the depositions in a fourth of the time that you could read them here to me. You may start reading that,

and we will see how we will get along. [622]

(Thereupon, counsel proceeded with the reading of the narrative statement, pending the conclusion of which an adjournment was taken until Tuesday, September 7, 1920, at ten o'clock A. M.) [623]

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In the Southern Division of the United States District Court for the Northern District of California, Second Division.

Before Hon. FRANK S. DIETRICH, Judge.

No. 485—IN EQUITY.

LAYNE & BOWLER CORPORATION,  
Plaintiff,

vs.

WESTERN WELL WORKS, INC., et al.,  
Defendants.

**Proceedings Had September 7, 1920.**

Tuesday, September 7, 1920. [624]

In the Southern Division of the United States District Court, in and for the Northern District of California, Second Division.

Before Hon. FRANK S. DIETRICH, Judge.

No. 485—IN EQUITY.

LAYNE & BOWLER CORPORATION,  
Plaintiff,

vs.

WESTERN WELLS WORKS, INC. (a Corporation),  
ROTARY DRILLING & DEVELOPMENT COMPANY (a Corporation), STAN-



LEY H. HALSTEAD, P. E. VAUGHAN  
and ALLEN W. ROSS,

Defendants.

Tuesday, September 7, 1920.

Counsel Appearing:

For the Plaintiff: FREDERICK S. LYON, Esq.,  
and WILLIAM K. WHITE, Esq.

For the Defendants: CHARLES E. TOWNSEND,  
Esq., and W. A. LOFTUS, Esq.

Mr. LOFTUS.—In these depositions of Frank Jackson and Robb, which were referred to at the last session, there is a stipulation between the attorneys to the effect that a certified copy may be admitted in this case. These depositions were taken in the case down in Los Angeles. I want to offer these, and ask that they be ordered filed.

In that connection there is a blue-print, Exhibit 2, which is certified and which is referred to in those depositions; it might be attached to the depositions instead of being offered separately, if there is no objection. [625]

Mr. LYON.—We have no objection, reserving, however, the possibility of error, and that they might be corrected if any error is found. The certification is by the stenographer, and not by the court. We are reserving, in the reading of the depositions in evidence, our general objection in regard to estoppel, etc.

The COURT.—Very well.

Mr. LOFTUS.—Now, in order to get over these depositions, the Jackson, Robb and Meade depositions all relate to substantially the same transac-

tion, Jackson and Robb being largely corroborative of Meade's testimony. The Meade deposition has three aspects. The first pertains to some preliminary discussions between Professor Meade and Byron Jackson, of San Francisco, and is shown in some correspondence and some blue-prints which I have separated here, and which I would like to have the Court glance over. There is so much data in that deposition that this may expedite matters a great deal if the Court will glance this over. That correspondence occurred in 1902. There are blue-prints there which are explanatory of the subjects discussed in this different letters. It will be noted that the question was first put to Byron Jackson by Professor Meade regarding a deep-well centrifugal pump, and that Byron Jackson replied that he was able to supply such a pump, and in fact had tested one in his shop in 1900, or in 1901, and sent blue-prints illustrative of that pump test. As a result of that correspondence, Professor Meade, who was a consulting engineer for the Pabst Brewing Company, entered into a contract with Byron Jackson to supply a commercial structure for the Pabst Brewing Company. The pertinent parts of the correspondence relating to the Pabst installation [626] are shown in these few letters which I have grouped here; and the blue-prints of the Pabst installation are shown there, also. Your Honor may see at a glance just what occurred in 1902. The Pabst matter came up in 1903. I think the subject was first opened up in March, 1903—I think it was on March 18th. That was some six weeks prior to the filing date of the Layne application for the patent which

is here in suit. On April 20, several days before Layne had filed, Byron Jackson had sent a formal contract which he asked the Pabst Brewing Company to sign, and in that communication he described exactly the structure Layne claims is covered by his patent.

Mr. LYON.—Your Honor will understand that these papers that are handed to the Court at this time I have never seen. These are not exhibits.

Mr. LOFTUS.—That is very true. To select them from the exhibits here would be quite a long task; there is so much data in the depositions.

Mr. LYON.—I do not agree that these are correct. I do not know that they are incorrect, but, however, I do not agree that they are correct.

Mr. LOFTUS.—That Pabst matter was started in March, the drawings were started in March, 1903. The correspondence continued and discussion was had over the terms of the contract. The pump was finally made and was tested here in San Francisco in, I think, June or July, 1903. The pump was then shipped east, and was installed, and was accepted in January, 1904. While plaintiff's counsel contends that these matters are not material, inasmuch as the pump was not actually installed and operated until after Layne filed, I think they are material, in view of the manner in which we have pleaded this defense, [627] that is to say, that Byron Jackson was a prior inventor and was using reasonable diligence to reduce his ideas to practice; and also that Professor Meade had knowledge of substantially the same invention prior to the date when Layne, the patentee of the patent in suit, conceived his inven-

tion. There is also some question as to the time when Layne actually conceived the invention of these claims in suit. The history of the Layne patent shows that very little was said about the enclosing casing, or about its being tight, or that the line shaft was cut off from the water, until there was an amendment in 1904. All of this correspondence will have some bearing upon the facts which will come out later. Now, those three depositions, of Meade, Jackson and Robb conclude what we term the Byron Jackson prior invention.

Here is one other depositions, which was taken in Chicago, and pertains to what is called the Alvord defense. John W. Alvord is a Chicago engineer. He is the patentee of United States letters patent No. 735,690, means for aligning pump shafts in well cases. That patent was applied for in 1902, in September, I think, and granted in 1903. It is true that these Alvord patents have been before the courts in some of the other litigation, but it will be noted that in those other suits the Alvord patents were merely set up as part of the prior art, set up as prior patents. The courts held that they had no weight in that connection, inasmuch as they did not become patents until after Layne had filed his application. However, in our case, we have pleaded John W. Alvord as having knowledge of substantially the same invention prior to the Layne date of invention, and also as being a prior inventor who was using reasonable diligence to reduce his [628] invention to practice or to patent the same.

As bearing upon the inequitable conduct of the plaintiff here, and possibly as showing an admis-

sion on the part of the plaintiff, that this phase of the Alvord defense presents a new question, I want to refer briefly to certain things which occurred at the time of the taking of this deposition, all of which are not shown in the record.

We served notice upon the plaintiff, I think in January, 1920, that we would proceed to Chicago to take the deposition of John W. Alvord. We did so. We arrived in Chicago I think on February 11, 1920. Prior to that time, one of the attorneys for the defendant had talked to Mr. Alvord and had been assured that he had this evidence in his possession, and was willing to produce it if called upon.

We arrived in Chicago on February 11, 1920, and went to Mr. Alvord, and asked him to take the stand and give his testimony. He refused to do it. He stated that he was busy on other matters and could not take the time to look up his records. He showed no disposition to find the time to do it, and even though we allowed him greater time in which to make preparations, he did not do so. We then resorted to a subpoena and had him put on the stand. Without refusing to talk, he was unprepared, he claiming that he had no time to look up his records. In order to give him further time, the taking of his testimony was, by a series of continuances, put over to March 2, 1920. On that date the real reason came out why he had refused to give this testimony prior to that time. I will read that part of his testimony. He explained that on February 2, 1920, which was after we had served

notice on the plaintiff that we would take Mr. Alvord's testimony,— [629] Mr. Alvord says:

“On February 2, 1920, Mr. J. B. Harmon, whose card left with me showed him to have been sales engineer of the Layne & Bowler Company, with headquarters at Memphis, Tenn., called at my office to take up the matter of my patents in connection with his company's operations. Mr. Harmon represented that in his opinion Messrs. Layne & Bowler were developing their ideas in the Patent Office on or about the time when I was at work similarly in developing my ideas. Mr. Harmon inquired what I would expect to receive from my patents in the matter, and I named him a price of \$5,000.”

In that connection, your Honor, I ask you to bear in mind that those Alvord patents had but about a year and a half to run, they would expire in about a year and a half.

“Thereupon, he asked me if I would give him a short option on that amount, and I gave him a 30-day option for the purchase of the patents. Mr. Harmon represented to me that those patents would be quite valuable to his company, and that they were doing a large business in the sale of these pumps, amounting, as he said, to some \$3,000,000 per year, and that the rice industry could not have been promoted without the use of the pumps in question, and the improvements which they and I had made. He further stated that if the

Layne & Bowler Company should own my patents, they could undoubtedly collect royalty from other companies which were using the same, and that he would recommend to Mr. Layne promptly the purchase of my three patents. Whereupon I had written out my proposition in writing, signing it, and gave it to him on that date."

That option was introduced in evidence as Defendant's Exhibit "A-12." [630] It is a letter written by Mr. Alvord to J. B. Harmon, Sales Engineer of the Layne & Bowler Company, dated February 2, 1920. It reads as follows:

"In accordance with our conversation this afternoon, I would propose to sell the Layne & Bowler Company all right, title and interest which I have in the patents relating to deep well pump shaft alignment and other related contrivances with reference to vertical centrifugal pump equipment, all for the sum of \$5,000 cash, with the understanding that these patents be used by your company, being known as the Alvord patents numbered as per Patent Office; and the further understanding that this proposition is accepted within thirty days from the date of your offer. I will further support said patents by competent testimony in court, if called upon to do so, at the rate of \$100 per day and necessary expenses."

Needless to say, that option was never taken up. When it expired, on March 2, 1920, Mr. Alvord evidently appreciated that he had been deceived

somewhat by Mr. Harmon, and he gladly consented to testify for the defendants in this case. In that connection, his testimony relates to dates when he conceived that pump aligning mechanism. It includes various drawings and photographs of the same. His earliest drawing, I think, is shown about May 20, 1902. The deposition is not as voluminous as some of the others, and I don't think it will be necessary to refer any further to it, except to point out that there is ample proof to show that Mr. Alvord had a complete conception of this invention, he had made drawings of the same early in 1902, which is long prior to any date which Layne may claim.

Mr. LYON.—The Alvord deposition, itself, is subject [631] to our same objection, your Honor, the objection of estoppel, etc.

The COURT.—Yes.

Mr. TOWNSEND.—In connection with the Alvord deposition, I offer the certified copy of file wrappers and contents of the Alvord patents, establishing the date of invention at least as early as the date of the filing. The certified copy of file wrapper of patent 735,690, can be marked Defendants' Exhibit "P"; 735,691 as Defendants' Exhibit "Q";, 735,692 as Defendants' Exhibit "R."

As Defendants' Exhibit "S," I offer certified copy of the master's report—

Mr. LYON.—Just a moment. I thought you had another file-wrapper to offer.

Mr. TOWNSEND.—No, just the three.

Mr. LYON.—To each one of those file-wrappers we object upon the ground of estoppel, etc.; and on



the further ground that they are immaterial, and self-serving, and incompetent. The only portion of the file-wrappers that could for any purpose be material in this case would be the original applications as filed. To all that is in the file-wrappers otherwise than in the original application of Alvord as filed, and so much of the record as shows the date of the filing, we object as immaterial, irrelevant and incompetent.

The COURT.—They may go in subject to the objection.

Mr. TOWNSEND.—As Defendants' Exhibit "S," I offer a certified copy of the master's report in the Los Angeles suit, as we have termed it, being the case of Layne & Bowler, a Corporation, Plaintiff, vs. The American Well & Prospecting Company et al., pending in the Southern District of California, Southern [632] Division, a report which was just recently made to the Honorable Oscar A. Trippet, the Judge of said court, and filed on July 13, 1920, in which he finds, with regard to the American Well & Prospecting Company's devices there used, that one used prior to the suit was an infringement, and the one used subsequently to the suit is a noninfringement. I suppose you will admit, Mr. Lyon, that these blue-prints are substantially correct, the one marked A and the one marked B?

Mr. LYON.—There is no objection to the master's report, save and except upon the ground of estoppel, and on the further ground that these defendants have participated in the taking of certain depositions, the Meade deposition in particular, in

the Byron Jackson case, and are probably estopped by privity in that case. We will argue that later.

To the blue-prints we object upon the ground that they are incompetent, no foundation laid, and not properly certified. I would not reserve that objection, may it please your Honor, if it were not for the fact that there is not enough shown in the blue-prints to show the facts in the case. One of the biggest contests in that case was at to what was the defendant's structure, and particularly what was the second structure of the defendant. Therefore, I must reserve the objection that the blue-prints are not sufficient to really show the Court what the structure of the defendant, either as first used or as second used by the defendants in that case was.

Mr. TOWNSEND.—I ask that this blue-print I have referred to be marked "Defendants' Exhibit 'T' for Identification," being the blue-print marked "A," and the blue-print marked "B" be marked "Defendant's Exhibit 'U' for Identification."

Mr. LYON.—If I had a blue-print that fully showed this [633] I would be very glad to produce it, but I haven't got one, and there was not one in the case.

Mr. TOWNSEND.—If your Honor please, I have one witness I can put on now before we have occasion to refer to the models. We will either have to have the models brought over from the other room, or else we will have to ask your Honor to move back to the room where the models are.

The COURT.—I think they will have to be

brought here, because it is intended that we shall occupy this room now.

Mr. LYON.—I will state that we were taken very much by surprise in that matter, your Honor, and we will have to get some men to move those structures over here; they are very heavy.

The COURT.—But you can proceed now, can't you?

Mr. TOWNSEND.—I can with one witness, any way, your Honor.

**Testimony of Emil T. Nielsen, for Defendants.**

EMIL T. NIELSEN, called for the defendants, sworn.

Mr. TOWNSEND.—Q. Mr. Nielsen, will you please state your name, your age, your residence and your occupation.

A. Emil T. Nielsen; age, 36; residence, Cupertino; occupation, orchardist.

Q. Cupertino is located near San Jose?

A. About ten miles from San Jose.

Q. Did you ever buy a Western Wells Works pump? A. I did.

Q. When?

A. In February; in January or February of 1919,—no, 1918; I beg your pardon, it was 1917.

Q. In January or February, 1917? A. Yes.

Q. Did you ever have any trouble with that pump?

A. It has given a little trouble. [634]

Q. Will you explain the nature of that trouble, and what you did?

A. Shortly after it was installed it developed a

(Testimony of Emil T. Nielsen.)

leak through the oil tube, water came out of the stuffing-box, washing all the oil up with it. In pulling the pump, in April, I believe it was, shortly after it was installed, at any rate, we found down seven lengths below on the surface a cross-thread which kept the oil tube part away from the boxing, and allowing an excessive quantity of water to enter there.

Q. What was the part that was threaded?

A. The casing.

Q. The discharge casing?

A. Yes, the discharge casing was threaded, and the coupling.

Q. What did you do to remedy that cross-thread on the discharge casing?

A. It was replaced.

Q. After that, did you have any further trouble with the pump?

A. The next year it ran all right; in November of 1919 it developed a vibration, and finally stopped, stopped working. Then down close to the bottom of the discharge column, in a place where the casing had been spotted up or trued up, too much metal had been cut away and it had parted.

Q. When you speak of "casing," do you mean the discharge column?

A. Yes, the 6-inch discharge column.

Q. Then what happened?

A. It evidently had been parted for some time, because the places were rusted over, and it allowed the whole thing to separate a little bit, and the water entered there in large quantities; no lubri-

(Testimony of Emil T. Nielsen.)

cant of any kind could get near it; it simply wore some of the boxing out.

Q. And when the casing parted and dropped, what happened?

A. It didn't drop. There was still a little bit of the casing left to hold it together.

Q. But the pump stopped operating?

A. Yes, sir. [635]

Q. What did you do to remedy that?

A. It was taken out and rebuilt and replaced.

Q. What sort of a pump have you there now?

A. The Western pump.

Q. Have you had any difficulty with it since it has been replaced or fixed over, since last year?

A. During the summer we lowered the pump and got into a crook in the well, the well was badly crooked down there, and the vibration of the shaft knocked out the same boxing.

Q. Your pump is installed in a crooked well?

A. It is now, yes.

Q. And that causes some vibration of the shaft, does it? A. It does.

Q. When you replaced the column in November of last year, do you know why the replacement was made?

A. The boxings have oil grooves in them, and my impression is that the replacement was made because the old oil grooves are cut straight down the side, and the new ones are spiral, and I believe Mr. Halstead wanted to make some tests on an old casing in a pit well.

Mr. LYON.—I move to strike out the answer of

(Testimony of Emil T. Nielsen.)

the witness upon the ground that it is the guess of the witness, especially that portion where he says, he believes or he thinks, upon the ground that it is incompetent.

The COURT.—The motion is granted.

Mr. TOWNSEND.—Q. In replacing the pump, was a change made in the bearings?

A. That change was made.

Q. They put in spiral bearings, in place of old straight bearings? A. Yes, sir.

Q. Did Mr. Halstead state any further reasons why he wanted to make the replacement?

A. Except that he wanted the old pump for testing purposes, and to examine it, and all like that.

Mr. TOWNSEND.—That is all. [636]

Mr. LYON.—No questions.

### **Testimony of D. J. Conant, for Defendants.**

D. J. CONANT, called for the defendants, sworn.

Mr. TOWNSEND.—Q. Will you please state your occupation?

A. I am engineer for the Western Well Works of San Jose.

Q. That is the defendant in this case?

A. Yes.

Q. How long have you been connected with the Western Well Works?

A. I first became associated with them in August, 1916.

Q. Are you familiar with the construction of the pump of the Western Well Works, and here

(Testimony of D. J. Conant.)

claimed to be an infringement in this suit?

A. Yes, sir.

Q. I show you a model, and ask you if you know what that is.

A. That is a model made substantially correctly with the pump we have built and are still building.

Q. Who made the model, or by whose direction was it made?

A. The model was made in our own shop, under my direct supervision.

Mr. TOWNSEND.—I ask that this model be marked Defendants' Exhibit "V."

Q. How does this model compare with actual pumps sold commercially by the Western Well Works?

A. If I may refer to the model, I will explain: The pump consists essentially of three parts—

Q. No, just answer my question: How does it compare in construction and design with the commercial pumps of the defendant?

A. The pump is identical with the pumps manufactured and sold by the defendant in so far as their lateral dimensions are concerned; that is, below this point on the top part, showing the bowl and this bracket are parts which complete the pump and are not exactly as manufactured; the head is larger and [637] carries larger bearings, etc.; but as regards the columns, they have been made from our standard patterns, and made with our standard forming tools, those always used in the shop. In the tube section, the length of shaft, length of discharge column, they are necessarily

(Testimony of D. J. Conant.)

much shorter, but they have the same inside and outside diameters, and the same clearances, having been made on our standard forming tools.

Q. Will you briefly describe the construction of the defendant's pump as shown by your model, Defendants' Exhibit "B"?

A. The pump consists of three essential parts, the pumping mechanism or the bowls, which are located on the bottom and shown here with just one; the discharge column, which contains the driving shaft, and the tube construction surrounding that, and the head, which rests on top of the ground.

Starting in at the bottom, first there is the bowl; these have been numbered; this bowl is marked No. 4; it is a casting which contains a runner or impeller, and passages to carry the water from the periphery of the impeller into a circular chamber, and discharge it through an adapter casting, which connects between that bowl and the discharge column. The bowl, 4, and the adapter casting, 17, are threaded together; there is a machine fit between the two, which makes a water-tight joint, being tightened down by threads, and it does not use any gasket for that joint.

Q. What is the number of the adapter casting?

A. 17.

Q. What is the discharge column number?

A. The discharge column in sections are 9b, 9a and 9. There are three shown. Connecting the sections of the discharge column are what are termed combination couplings, numbered here 17a and 17b. These are castings which not only pro-



(Testimony of D. J. Conant.)

vide connecting means between the discharge [638] section, 9b and 9a, but also carry a central hub supported on webs, which serves as a bearing for the shaft. On the ends of hubs, or the ends of this bearing, they are machined and provide a place for the tube, which is slipped over that and encloses this shaft.

Now, as to the connection between these different parts, the casing or discharge column has a special, straight thread cut on it, and screws down into both the adapter casting, 17, and the combination coupling, 17a, 17b, to a flat machined surface. It seats instead of tightening the threads by this construction as nearly as possible to a straight column. The same thing is true of the tubes, they are machined. But those tubes are shorter in the discharge column, in shop practice,  $1/32$ d of an inch. This is to provide so that the discharge column which carries the weight and is tightened to a seat will come to that seat before the tube seats at the ends on the hub. That means that the tube will not seat at the end of the hub, being shorter,—the discharge column tightens and the tubes will not seat. In this adapter bearing casting, 17, there are provided two tubes, designated here by the number 28. These tubes connect between the well and a recess surrounding the shaft, and spaced about midway in the bearing of casting 17. This discharge column connects with the discharge head by a threaded connection similar to these different column connections. That joint carries the weight of the pump. The impeller, placed in this bowl, is attached to the

(Testimony of D. J. Conant.)

shaft by means of a gib-head key, the head of the key being on the bottom in such a position that the runner cannot drop off without shearing the end of the key. The different shaft lengths, starting in with the runner shaft, [639] are connected by collars, shown here as 7, 7' and 7". The separate shafts are butted on a machine-faced surface, and terminating at the top of the pump, at the pulley. There is a thrust bearing placed under the pulley, and a nut that screws onto the top of the shaft and seats the pulley hub, blocked in position by a key, so that the weight of the runner shaft and the runner are carried on a pulley bearing on the top of the pump above this thrust bearing, so that the entire weight of the shaft is carried from the surface. At the top of the tubing column is a bearing which we term a tube bearing, marked here 11. That is threaded into the discharge head as a hub on the lower end which enters the top tube; when this is screwed into position, it forms a water-tight joint between the tubing bearing and the discharge head. This tubing bearing is provided with tapped holes to receive a pipe line and the method of lubrication. That is an ordinary drip-feed oil cup, which screws into an elbow attached to this pipe which I mentioned. There is a small recess at the top of this tubing bearing which provides an oil reservoir for this oil before it enters the tube and passes down. This tubing bearing is provided with a spiral oil groove, which assists in the passage of the oil from this recess. In the different sections of discharge casing tubing and shaft, they are made to the stan-

(Testimony of D. J. Conant.)

dard length, each piece of discharge casing, except one in each pump, which is the one just below the discharge head, is exactly the same length; the tube sections are all of uniform length. The shaft lengths are uniform. This has been our method throughout the manufacture of pumps, in order to have interchangeable parts. In order to arrive at this, we have gages for the exact length of every part, and we have master gages to check these by. We [640] have gages for the threads, the diameter, the clearances. So that these parts are manufactured in quantity, on quantity production machines, or forming tools; and there is no hand fitting in the assembling of the pumps. There is an inspection and a checking of dimensions, and when they are checked they are put into stock. The pump is built of so many units; it is not a special pump. For instance, there are so many units, such as 9a, such as 17b, so many couplings, so many tubes, and these are put together in the field without any hand fitting.

Q. Is any weight carried on the shaft tubing sections which are marked as—

A. There is only one of them marked, and that is No. 8, shown on the top.

Mr. LYON.—We object to the counsel leading the witness.

The COURT.—I think he may answer that.

A. (Continuing.) There is no weight taken on the tubing connection, on the tubing itself, for the reason that tube lengths, as I stated before, are  $1/32$ d of an inch shorter than the discharge col-

(Testimony of D. J. Conant.)

umn lengths. The face on the bearing hub, which the tube would have to seat on, is exactly the same distance as the seat for the discharge column. Since the tube is shorter than the discharge column, the tube never seats on both ends at the same time. In some installations, it might seat on one end, and in the next installation seat on the other. It is purposely made shorter, so that the discharge column seats and the tube does not. Therefore, it cannot carry any weight but its own individual weight.

**Q.** How does the fit of the tube sections, 8, on the bearing hubs compare with the fit of the tube sections and the hubs in actual practice?

**A.** This pump model was built on our standard forming tools. The hubs were machined with standard [641] tools, so they would have exactly the same dimensions as those put out in practice. The tubes were reamed with our shop reamers, those which are used in standard practice. If there is any difference in fit between any of them now it would be due to putting them on and taking them off, which would make them slightly looser by that means; there has been no other change.

**Q.** Here is a casting which has been marked "Defendants' Exhibit 'C' for Identification"; I ask you if you know what that is.

**A.** It appears to be one of our standard combination 7-inch couplings.

**Q.** That shows the groove bearing, does it not?

**A.** That shows the spiral groove bearing.

**Mr. TOWNSEND.**—I ask that this be marked "Defendants' Exhibit 'C.' "

(Testimony of D. J. Conant.)

Mr. LYON.—You are offering it in evidence, are you.

Mr. TOWNSEND.—Yes, I am offering it.

Mr. LYON.—We object to it upon the ground that it is incompetent, and no foundation laid.

Mr. TOWNSEND.—Q. Do you know where that casting was made?

A. I did not see the manufacture of this casting, but to all appearances it is a casting made in our plant—not a casting made in our own plant, but it is the machine work that was done in our own plant.

Mr. LYON.—It is the machine work I am questioning, your Honor, and that is the reason I am objecting. If this witness is able to state that this is machined the same as the ones they put in their pump, then our objection will be withdrawn.

Q. Have you checked the machining on the hubs of that casting? That is what we want to know.

Mr. TOWNSEND.—Let me ask the witness a question. [642]

Mr. LYON.—We want to know if the witness, himself, has checked the hub, and the taper on the hubs of this casting.

Q. Do you know if that is as you put them out?

A. Are you asking me that question?

Q. Yes. A. Any casting that—

Q. Answer the question; have you checked this one?

A. I have not checked that one. I don't check any of them, except for special purposes.

Mr. LYON.—Then we object, your Honor. We want one of them as they put them out. We want

(Testimony of D. J. Conant.)

somebody to be willing to stake this case on the truth of the exhibit representing the finished product as they use it. The whole question in this case will come right down to the matter of these measurements, this tapering and this construction.

Mr. TOWNSEND.—Q. Is this a stock casting of the Western Well Works?

Mr. LYON.—I object to that, your Honor, as leading.

The COURT.—The objection is sustained.

Mr. TOWNSEND.—Q. Would you be able to identify a stock casting of your construction?

Mr. WHITE.—If your Honor please, the witness has already disqualified himself from answering this question. He has testified that he has not checked this up. He cannot say that that is identical in measurements with the casting they put out in their pumps. This is really a case, your Honor, of very fine measurements.

Mr. TOWNSEND.—Q. How does that compare with the stock casting?

Mr. LYON.—We object to that, if your Honor please, as immaterial, irrelevant and incompetent.

The COURT.—The objection is sustained. He has already [643] stated that he has not checked this up. Any testimony he might give in response to your question would be a guess or an opinion, merely.

Mr. LYON.—We have the instruments here with which to measure this.

Q. Do you know the measurements of that taper

(Testimony of D. J. Conant.)

on the hub, the diameter at the top and at the end? Do you know those measurements offhand, so that if we give you the necessary instruments you can measure this now?

A. No; I don't know those measurements.

Q. Do you remember the standard measurements according to practice?

The COURT.—I understood the witness to say he did not know offhand what the measurements should be or are.

Q. It that right, Mr. Witness?

A. There is one point in regard to these measurements that I cannot definitely state, the diameter of the hub at this point where it is straight is .006 of an inch less than the taper on the last  $\frac{3}{4}$  of an inch.

Mr. TOWNSEND.—Q. You mean that is what it should be? A. That is what it should be.

Q. Would you state that if this casting corresponds to those measurements that this is a true and correct hub casting of the defendant?

Mr. LYON.—We object to that as leading, your Honor.

The COURT.—The objection is sustained.

Mr. TOWNSEND.—Q. Can you ascertain from the formula you have just given if that is a correct casting?

A. Providing I have instruments to measure it, yes.

Mr. TOWNSEND.—Mr. Lyon, will you furnish the instruments? You were offering to furnish instruments a moment ago.

Mr. LYON.—Before doing that, I want to know

(Testimony of D. J. Conant.)

what your [644] measurements are.

Q. What is the diameter at the top of this hub, and just below the shoulder that I now point at?

A. The dimension below that shoulder is not machined.

Q. Right there.

A. There is no shoulder excepting at the bottom of your pencil there.

Q. What is the diameter right at the juncture of that shoulder with the hub?

A. It should have a taper of 1/6000ths.

Q. What is the diameter?

A. In the manufacture there is no given diameter at that point.

Q. What is the diameter at the end of the hub?

A. The matter simply resolves itself down to this, that—

Mr. LYON.—I submit, if your Honor please, if the witness cannot answer that question he is incompetent to make a measurement.

Mr. TOWNSEND.—Q. What is the shop practice in determining the proper diameter and the taper of the hubs?

A. In our shop practice, we have Holton's steel gages, a gage which presses into the end of the tube, a gage which passes over the hub; there are trial and error fits on those. The forming tools which machine these are set at intervals during the process of manufacture; it might be a matter of three weeks, or four weeks, or six weeks. They are set to those gages. We set to a gage, but not to an exact dimension. We have these gages both as



(Testimony of D. J. Conant.)

master gages and as shop gages. It is for that reason I cannot give you the exact dimension of it.

Mr. TOWNSEND.—I submit, your Honor, that the witness has qualified himself to identify this as the Western Well Works casting used in the regular practice. I offer the casting in evidence.

The COURT.—Can't you identify it by somebody who does know? [645]

Mr. TOWNSEND.—I could bring the machinist from San Jose to identify it. If that is desired, I will do that.

Mr. LYON.—We have not had an opportunity to measure this up, your Honor, but we measured up a number of them out in the field.

Mr. TOWNSEND.—That is not in evidence, Mr. Lyon.

Mr. LYON.—Well, I am telling the Court something. If we had an opportunity to put Mr. Doble on this casting with his instruments, we could tell you whether we can stipulate to it, or not. I have been trying to get from this witness whether he knows. Evidently, this witness cannot make the measurements for me. Mr. Doble might be able to satisfy me whether this particular casting is or is not in accordance with those in the pumps. I suggest that if you have something else you can do, Mr. Townsend, we can let Mr. Doble take this casting and measure it. Really, it is immaterial what this particular casting is, the question is what is in the pump we have offered in evidence. That is the infringing article in this litigation, the Anderson pump which we have offered in evidence, and which

(Testimony of D. J. Conant.)

is on the floor of the courtroom.

Mr. TOWNSEND.—Supposing we pass the matter for the time being, and we will have measurements made.

Mr. LYON.—Would you mind letting Mr. Doble measure it?

Mr. TOWNSEND.—Certainly, go ahead and make all the measurements you want to.

Q. I show you another model, and ask you if you know what that is?

A. This is a model made after the drawings and specifications of the Layne patent in question.

Q. Who made the model, or by whose direction was it made?

A. This model was also made in our shops, and under my direct [646] supervision.

Mr. TOWNSEND.—I ask that this be marked "Defendants' Exhibit 'B'"; it was previously marked for identification.

Mr. LYON.—I don't like to make an objection to this model, but if the Court understands that in some particulars—I don't believe it is material myself—the model does not follow the drawings. There are a few changes from the actual drawings. If that is understood, it is all right. In our opinion it would be a matter of mere mechanical equivalents.

Mr. TOWNSEND.—There are slight differences with regard to connecting certain parts together by screw threads rather than a bolt.

Mr. LYON.—And the bearings are not put in identically the same. I noticed that.

The WITNESS.—That is the matter Mr. Town-

(Testimony of D. J. Conant.)

send just spoke of, that they are threaded in instead of clamped between two columns.

Mr. LYON.—And they lack one other feature of the patent. There is one shown here. There is one fastening here instead of a number of those, as the patent points out.

Mr. TOWNSEND.—Q. Do you know about any tests made of the Western Well Works pump in operation? A. Yes, sir.

Q. Who made those tests?

A. Those tests were made by Professor E. P. Lesley.

Q. Where were they made?

A. In a pit on the Conant ranch, in San Jose.

Q. Do you know the pump that was used for making those tests? A. Yes, sir.

Q. What was it?

A. It was a set of 10-inch pump bowls, new, and a new runner shaft, a discharge column which had been removed [647] from the Nielson well, on Prospect Road, San Jose, and a new head.

Q. Was that the Mr. Nielsen who just testified here this morning?

A. I was not in here when the testimony was taken this morning.

Mr. TOWNSEND.—It will be stipulated, Mr. Lyon, that it was the same Mr. Nielsen?

Mr. LYON.—I don't know anything about it. We will object to the test as not being the pump involved in this case. We are basing our case, so far as the allegation of infringement is concerned, on the Anderson pump in evidence. It is readily

(Testimony of D. J. Conant.)

seen that they could change this construction; whether they put out other pumps exactly like that, or not, will be a question for the master later. Our case is based on the Anderson pump in evidence, and not on what they might produce in some other line of pump.

Mr. TOWNSEND.—Q. Was that Nielson pump a Western Well Works pump? A. Yes.

Mr. TOWNSEND.—That is all.

Cross-examination.

Mr. WHITE.—Q. I believe you stated that you entered the employ of the Western Well Works in August, 1916? A. Yes.

Q. At that time, did you become chief engineer of that defendant?

A. I was draftsman for the company at that time.

Q. At that time, were you familiar with the details of construction of these hubs projecting at either side of these bearings? A. Yes.

Q. Just describe the form of hub used at that time, in August, 1916, in respect to the presence of any taper, or the absence of any taper.

A. The hubs at that time, according to the drawings, which were the only thing I had to go by, were a straight hub. [648]

Q. And for what period of time after August, 1916, were these hubs made with straight sides?

A. I cannot give it to you as an exact date.

Q. Approximately how long?

A. About the first of 1917.

Q. During that period, how many pumps had been sold by the Western Well Works and embody-

(Testimony of D. J. Conant.)

ing this construction of these hubs having straight sides?

A. I cannot answer that question, because I had no connection with the sales of the pumps.

Q. Can you give any estimate? Only a very few—is that correct?

A. I cannot give an estimate as to the number.

Q. When did the Western Well Works begin making this construction having hubs without straight sides?

A. As I stated before, about the first of 1917.

Q. Why was that change made, and what was the change that was made in the formation of these hubs?

A. The change was a slight taper on the end of the hub nearest to the shoulder. That change was made in order to center the tubes and to provide the necessary seat, because the tubes were shorter than the length of the discharge column.

Q. About what period of time was that form of hub made by the Western Well Works?

A. That form of hub is made to the present day.

Q. As I understand, your description of that form of hub, the sides nearest the outer end of the hub are parallel and straight: Is that correct?

A. Yes.

Q. And then a short distance from the seat the taper begins: Is that correct?

A. A matter of approximately  $\frac{3}{4}$  of an inch from the shoulder.

Q. And below the point  $\frac{3}{4}$  of an inch from the

(Testimony of D. J. Conant.)

shoulder to the end of the hub there is no taper: Is that correct?

A. That [649] depends on which end of the combination coupling you are looking at.

Q. Either one.

A. One would have a taper above the point, and the other straight below; it depends upon which end you are speaking of.

Q. In respect to any one hub, as I understand it, the taper begins about three-quarters of an inch from the shoulder or seat: Is that correct?

A. I believe it is on the other model. If you take the lower hub, the shoulder is on the end above; if you take this end, it is below. What one do you refer to?

Q. I am speaking from the end of the hub, whether the end is down below, or above?

A. That hub is straight at the outside end.

Q. And continues straight up to three-quarters of an inch of the seat? A. Yes.

Q. And the taper begins: Is that correct?

A. The taper begins approximately  $\frac{3}{4}$  of an inch from that shoulder.

Q. As I understand it, the sides of the hub from the end to within  $\frac{3}{4}$  of an inch of the seat are straight and parallel? A. Parallel sides; yes.

Q. And then the taper begins, and you have on each hub, then, a taper  $\frac{3}{4}$  of an inch in width: Is that correct? A. At the present time.

Q. And that is true in regard to all of the hubs that have been constructed by the Western Well Works since early in 1917?

(Testimony of D. J. Conant.)

A. To my knowledge, yes.

Q. You have not varied that taper in any respect since that date?

A. Not to my knowledge. The variation might come in the setting of a tool, but that would be the only way.

Q. Do you know anything about the pumps you were supplying [650] to the parties occupying the Selby ranch, down here in San Mateo County?

A. I knew of the pumps at the time they were ordered, and casually saw them go through the shop.

Q. Do you know whether or not the hubs extending from the bearings on those pumps were of standard construction with respect to the taper?

A. Yes.

Q. They were?      A. Yes.

Q. And they are the same as the hubs which you are generally supplying in all your pump constructions, and have been since 1917: Is that correct?

A. Yes.

Q. In regard to leakage, what have you to say in respect to a hub which is tapered and a hub which has parallel sides, so far as preventing any water getting in between any joints formed between them and the tube sections?

A. It depends entirely on those tapers with respect to each other, whether the male and female taper are of the same length and diameter, or whether they are not.

Q. Assuming that the interior diameter of the enclosing casing is slightly less than the diameter of the tapered portion of the hub, and such a sec-

(Testimony of D. J. Conant.)

tion of casing is shoved up on the hub above the taper, under those circumstances what would you have to say in regard to the joint being more water-tight as compared with a joint formed between a straight side hub and such a section of casing?

A. Provided that the diameter of the tube were an easy fit on the straight part of the hub, it would not make a water-tight joint against pressure.

Q. What have you to say with regard to the joint formed with the section of the casing shoved up on the tapered hub?

A. That is what I have reference to, it will be a line contact at best, and because it is shoved up there, it will cut part of the metal and not give a smooth, perfect contact. [651]

Q. In shoving the section of casing up on the tapered hub, would not the section of casing be expanded slightly so as to form an absolutely tight joint between the hub and the tube casing?

A. In some cases it might possibly form a tight joint, but generally it would not, for the reason that the tube does not expand, and that taper fitted the entire length of it.

Q. In some cases, you say a tight joint would be formed by having a tapered casing shoved up?

A. Yes, say to a certain degree; sufficient pressure would cause it to leak. It is not a commercially water-tight joint. If I were to build a joint to make it water-tight, I would not use that system.

Q. Why do you use white lead in these joints on your construction?



(Testimony of D. J. Conant.)

A. White lead is used on that joint to prevent corrosion.

Q. Does it have any effect to prevent leakage?

A. Not that I know of, because the white lead is sufficiently fluid to be put on with a paint brush. It is not a sticky preparation with enough hardness; it will flow with water; pressure will force water through it.

Q. Have you ever substituted your pump construction for other pump constructions in which the shaft-bearings were not protected from the water in the well?

Mr. TOWNSEND.—That is objected to as not proper cross-examination.

The COURT.—The objection is overruled.

A. The only substitutions I know of were substitutions of the discharge column in place of the discharge column manufactured by other parties. I cannot say whether those bearings in the former construction were protected from the water, or not, if that is your question. [652]

Mr. WHITE.—Q. Have you ever had any experience with pumps used in San Mateo County and in Santa Clara County, where you have been selling your pumps, and in which other pumps the line-shaft bearings were not protected from water and sand in the well?

A. Not with deep well turbine pumps.

Q. What is the effect of water and sand on the bearings, where the bearings are not protected?

A. The effect of water and sand on bearings which are not protected is to cut them, increase the

(Testimony of D. J. Conant.)

bore through the wearing, and decrease the diameter of the shaft and cause rough surface.

Q. Did you ever hear of a deep well pump being operated under those conditions, and with the line shaft-bearings unprotected and as the result of an operation of about three hours the bearings were entirely destroyed?

A. I have seen a pump in which the bearings were destroyed by the action of sand and water.

Q. Within a short space of time, such as two or three hours?

A. Within a short space of time.

Q. What was the time?

A. I could not tell, because I simply saw the pump on top of the ground.

Q. Where was that?

A. That was on Santa Cruz Avenue, in San Mateo County—Menlo Park.

Q. And that is the district where you are selling a great many of your present constructed pumps?

A. We have one pump in that territory that I know of; there are others near it.

Q. About what length of time did that pump operate with the bearings unprotected, or the bearings worn out?

A. With regard to protection, I could not say; I don't know what the original installation was. I saw the bearings after they were worn.

Q. There are other means of protecting a bearing than enclosing it in a shaft, are there not?

A. Yes, there are other means [653] for protecting a bearing.

(Testimony of D. J. Conant.)

Q. Did you understand that from these bearings that they had not been protected from sand and water in the well, and, therefore, they were worn out?

A. There was an attempt to correct them.

Q. That attempt had failed and the bearings wore out?

A. As I understood the circumstances there, there were protective devices put on the ends of the bearings, but they were inadequate, and, possibly due to sand or something else, they started to wear, and the sand action finished the cutting.

Q. In other words, when the protecting means failed to accomplish the purpose for which they were installed in this construction, and did not protect the bearings from the water and the sand in the well, the bearings rapidly wore out and the structure became inoperative: Is that correct?

A. In that particular pump other influences than that caused the downfall of the pump.

Q. The pump would become inoperative if the bearings wore out; that is correct, isn't it?

A. The pump would not become inoperative; it would not operate as it was originally designed to. A shaft will turn in that length without bearings, it will rotate.

Q. It will rotate, but would not the structure be pounded to pieces in a very short time?

A. As far as I know, the pump supplied water until it was removed from the well.

Q. How long was that?

A. As I understand it, it was a matter of a few

(Testimony of D. J. Conant.)

hours. The pump was removed from the well when it stopped supplying water.

Q. Do you know anything about the installation of your pump, that is, do you go out in the fields where the pumps are installed?

A. I personally installed pumps; I watched others [654] being installed, and I have given instructions to install pumps.

Q. What is the practice of your company when installing pumps in regard to packing grease and oil in the shaft-enclosing casing? Just describe how the shaft-enclosing casing sections and the water discharge sections are combined when the pump is about to be put down into the well?

A. Starting in with the model as shown there, do you mean?

Q. Yes; I mean in respect to the use of grease and oil.

A. You start with Section 9b, assuming that the adapter bearing, 17, which corresponds to the size of the discharge column, has been placed on the pump bowl, 4; the runner shaft extends a matter of approximately 5 inches above the top of the bearing in the casting, 17. By means of a hoist, the combination as usually put on is raised and connected together by a rope sling. That combination consists of a discharge column, 9b, the tube, 8, and the section of shaft; on the discharge, 9b, is bearing, 17a; as it is arranged, the discharge column is placed with the combination coupling on the top. The tube extends through a matter of 8 or 10 inches, the shaft extends through below that; that is lower

(Testimony of D. J. Conant.)

down; the shaft is allowed to come through and is screwed into that coupling and tightened up with wrenches. Then while the discharge casing, 9b, with its combination coupling, is hanging and the tube attached to that, there is graphic grease placed around the top of that bearing; it is taken with a stick and just swabbed on there, probably as much as would extend over my fingers. Then on top of that is taken half a handful of cup grease and it is squeezed on there. The tube is released from the rope sling, slid over the hub on bearing 17, and the discharge column raised up so that it clears the end of the tube; a can of oil is raised [655] and a small amount poured in that tube. Then the discharge column and its coupling, 17a, is lowered down over this. The threads to this connection have been covered with graphic grease. The man on the derrick directs the combination coupling so that it will slide over the shaft, the assemblage is lowered, chain tongs gripping the casting, 17, and another pair of chain tongs around 9b, and this casing is screwed together. That leaves the casing just as it was before, you have a shafting extending above and you have a combination coupling on that. The next process is exactly like that.

Q. When these couplings are turned to bring the water discharge sections together, at the same time that you are pressing the shaft-enclosing casing section at each end and upon one of these hubs: Is that correct?

A. It depends entirely upon the fit. Sometimes when you place this tube over the end of the hub,

(Testimony of D. J. Conant.)

it will slide to a seat by hand, just of its own weight. In that case there is no pressure necessary to seat it.

Q. You have a taper of  $\frac{3}{4}$  of an inch on each of those hubs?

A. A taper  $\frac{3}{4}$  of an inch in length.

Q. On each one of those hubs? A. Yes.

Q. And between which you place the shaft-enclosing section of casing: Is that correct?

A. I think you have the hub outside the casing.

Q. Of course, the shaft-enclosing casing embraces the hubs, these two hubs? A. Yes.

Q. And you have  $\frac{3}{4}$  of an inch taper on each hub? A. It tapers  $\frac{3}{4}$  of an inch in length.

Q. You mean vertically?

A. I mean the length of the hub.

Q. And that shaft-enclosing casing is  $\frac{1}{32}$ d of an inch only shorter than one of these sections of water-discharge casing: [656] Is that correct?

A. That is correct.

Q. So that when the water-discharge section is brought to its seat the shaft-enclosing tubing section necessarily is pressed up on the tapered portion of each hub: Is that correct?

A. It will have ridden up close to the seat, but not necessarily on the taper, because that taper, as I have said, is  $\frac{3}{4}$  of an inch long. We never let a tube go out which will not pass down  $\frac{3}{8}$ ths of an inch of shoulder, which means that it has gone half way up on that taper. If they are tighter than that, they must go back and be re-reamed. It must go halfway the length of the taper without any obstruction at all, without any resistance. The rest

(Testimony of D. J. Conant.)

of that taper is a matter of the particular fit that that tube may come. Taking a reamer, which makes the ends of the tube, finishes them on the inside, those tubes vary in thickness, they run the reamer over it—the reamer is the thing that is gaged; the reamer may go in there and make a variation of 5/1000ths or 10/1000ths, because it will spread after the cut has been taken. So the tubes do not fit exactly alike for that reason; one goes down a certain distance, and one goes down not quite so far, although they are manufactured by the same tools.

Q. But the average fit between the tubes and these taper hubs is certainly very much improved by reason of the fact that the hub is not tapered and has not parallel sides?

A. There is no question at all but what there might be a slight variation.

Mr. LYON.—I move to strike out that answer, your Honor, as not responsive to the question.

The COURT.—Yes, let it be stricken out.

Mr. WHITE.—I may say to your Honor right now that if, when this case is closed, your Honor has any doubt whatever [657] about the facts of these joints, and so forth, we will ask your Honor to go into the field and examine some of the pumps in actual operation.

Mr. TOWNSEND.—We join in the invitation, your Honor, we will take you to the plant.

Mr. WHITE.—We don't want to go to the plant, we want to see the pumps in actual operation, if it comes to that.

(Testimony of D. J. Conant.)

Q. Now, will you answer my last question?

A. I cannot say that that improves the fit.

Q. In your opinion, it does not improve the fit, even though the tube has to be forced up on the taper: Is that correct?

A. It is a matter of what constitutes improvement on that fit.

The COURT.—Do you mean it tightens the fit?

Mr. WHITE.—Makes it a closer joint.

A. If I may cite an instance to your Honor—

The COURT.—No, just state generally whether it does or does not, or you may answer that you don't know, if that is the fact.

A. It makes a closer fit on the hub.

Mr. WHITE.—Q. You have written directions which your company gives the employees down there in respect to the manufacture of these hubs, and the diameters of the hubs, and the inner diameters of these hubs when they are being reamed out?

A. We have not written instructions; we have blue-prints specifying the dimensions, and from the blue-prints gages have been made, and all of the settings in manufacturing any of those parts are taken from the gages, not from the blue-prints.

Q. Could you produce a blue-print showing all of those measurements in regard to the hub construction and the tube construction?

Mr. TOWNSEND.—Isn't that inquiring into their shop practice, [658] your Honor? It is not pertinent to the present issues.



(Testimony of D. J. Conant.)

The COURT.—You have gone into that subject, haven't you?

Mr. TOWNSEND.—It is simply a question of whether there are any trade secrets involved. Of course, I want the Court to know all the facts in regard to the matter.

The COURT.—I cannot hardly see how that is a trade secret; however, if you contend that it is, I will hear you.

Mr. TOWNSEND.—I will inquire into the matter, your Honor. The objection is withdrawn. You may explain it.

Mr. WHITE.—Q. Have you a blue-print there which shows the exact measurements?

A. The blue-print which I have shows the adapter casting, 17, which is shown here, and which has one of these hubs. All of them are the same.

Q. Can you give the dimensions of the hub, showing what the amount of taper is?

A. I can present the blue-print which will give it direct.

Q. In constructing your pumps, is the inside of the shaft-enclosing casing sections reamed at the respective ends thereof? A. Yes.

Q. What is that done for?

A. That is done because the tube that is used is standard pipe, which is not circular, and varies considerably in diameter, both inside and out.

Q. So that by the reaming operation you insure the inner surface of the end of the tube being absolutely uniform?

A. No, sir, because that is wrought iron, and it

(Testimony of D. J. Conant.)

ters in machining, and you do not get a smooth surface when you ream one of these with a single cut.

Q. But reaming improves the inner surface with regard to smoothness, etc.? A. Naturally.

Q. So that you do get the benefit of smoothness, etc., as far as possible, by this reaming operation: Is that correct? [659]

A. There is no attempt to get a particularly smooth surface; otherwise, we would take a couple of cuts. The attempt is to get some uniformity in the diameter of that bore.

Q. What is the object of having a uniform diameter?

A. The attempt in the entire pump is to produce interchangeable parts. If you have a variation of as much as 1/16th of an inch in the diameter of a tube, it either will go on or it won't; it is too large a variation for any manufacturing product.

Q. You mean if the inner diameter of one of those tubes varies 1/16th of an inch it might go on the tube or might not go on the tube? A. Yes.

Q. Couldn't you take care of that variation very easily by having your hub tapered to a greater extent?

A. No, sir, because if they are tapered to a greater extent than it was put on there, it would split, which has been occasioned with the taper we have already tried at different times.

Q. Why do you have any taper at all, then?

A. We have cut that taper down to the minimum which will insure keeping the tube from rattling.

(Testimony of D. J. Conant.)

Q. Oh, the noise is what you are trying to eliminate, then, by this tight fit: Is that correct?

A. There is no need of putting a tube on there at all, unless you keep it somewhere near position.

Q. On account of this noise?     A. No, sir.

Q. Why does this rattle bother you?

A. The rattle is caused by vibration. Vibration will break bearings out of the hub if it comes from the shaft, or the tube, or anything else in connection with a highly rotating speed shaft.

Q. As I understand it, the vibration would be caused by the shaft: Is that correct?

A. Vibration originates with the [660] shaft; anything around it that is loose will vibrate with it.

Q. Assume that the shaft and the bearings of the shaft are on alignment, and the shaft is operating efficiently, how would any vibration be caused in the whole structure by one of those tubes rattling slightly?

A. As far as I know, it is not physically possible to get a shaft of the length of the commercial product which will not vibrate at that speed.

Q. What I want to get at is this: Do you mean to say that if one of those tubular sections rattled a bit, that that would cause a vibration in the whole structure, and affect the operation of the shaft?

A. If the tube would rattle, its own action would enlarge that to such an extent that it would have to be taken out.

Q. Assuming, now, that the shaft is not vibrating.

A. I don't know of a pump where the shaft will be perfectly quiet.

(Testimony of D. J. Conant.)

Q. Now, we will assume that the tube rattles a bit: That would indicate that the joint between the tube and one of these hubs was not a very tight joint: Is that correct?

A. That is correct.

Q. And you say that under those circumstances you would have to take the tube out?

A. Yes, in time.

Q. Why? A. Because that looseness increases.

Q. Why?

A. If you take any piece of metal and keep pounding it you will have to do that.

Q. Why would you have to take it out—what difference would it make whether it was loose, or not? You don't take it out because of the noise it makes, do you? Why do you take it out if it rattles?

A. Your entire tube line is supporting the individual sections. The supports for the bearings are on webs. If you get something that is of the weight of the tube and it will bounce around and rattle in there, it has the possibility of breaking that bearing, and entirely breaking [661] the webs.

Q. Why don't you eliminate this tube entirely? What is the use of it there anyway?

A. The tube is used for other purposes than to make a tight joint.

Q. What is it used for?

A. The tube is used to conduct oil between the bearings; it is used to surround the shaft; it makes a more perfect passage for the water; if you have a bearing that sticks out in a bunch, the water has

(Testimony of D. J. Conant.)

to pass around that and then come into a small shaft and enlarge again, reducing the efficiency. Every enlargement and enclosure will reduce the efficiency of your pump.

Q. What other purpose does the tube serve?

A. I have mentioned two.

Q. Any more?

A. It will prevent the scouring action of the sand carried with the water.

Q. Protect the bearings from the action of the water in the discharge column?

A. It will prevent the bearings against the action of the sand that is carried by the water in the discharge column.

Q. And, of course, that is a detrimental effect that the water has on the bearing?

A. It has other detrimental effects. The rust action on the shaft will cause corrosive action, as will sand.

Q. The hub that is disclosed in this blue-print which you handed me a few minutes ago has parallel sides, has it not?

A. Yes. Do you notice the date on that print?

Q. Yes, this is in 1916? A. Yes.

Q. But my question was, did you have any blue-prints showing the tapered hubs, and the amount of the taper?

A. Did you ask in regard to the taper? [662]

Q. Yes.

A. I thought you asked about the dimensions of the hub.

(Testimony of D. J. Conant.)

Q. No, I asked with regard to the amount of the taper.

A. I didn't know that you wanted the exact dimensions. I have not a blue-print with me showing that.

Q. Do you know whether any other parties here connected with the company might have such blue-print? A. I can't tell.

Q. Can you endeavor during the noon hour to produce such a blue-print showing the exact dimensions of the tapered hubs, illustrating the amount of the tapering, and where the tapering begins?

A. The only positive location of blue-prints that I know of in the office. I could not get those during the noon hour.

Q. You could produce such a blue-print to-morrow morning? A. Yes.

Mr. WHITE.—I will ask that such a blue-print be produced. That is all, your Honor, subject to the production of the blue-prints.

Mr. LYON.—I will state, your Honor, that in connection with this coupling which was offered for identification as Defendant's Exhibit "C," we are willing to stipulate that the hubs on that are substantially machined in accordance with the present practice of the defendant as shown in their pump structures, providing that it is a matter of record what those measurements are. I suggest that counsel have our measurements checked. We find, as a matter of fact—and this is what I want counsel to see if he finds also—that the taper is from the extreme end clear to the base, and that there is a difference of

(Testimony of D. J. Conant.)

58/1000ths in the diameter at the base, or where the hub joins the two areas of the casting, from the diameter at its outer edge.

Mr. TOWNSEND.—We will have our gages here this afternoon, [663] and then we will make the measurements and have them appear in the record. In view of plaintiff's suggested stipulation, I will ask that this be marked "Defendant's Exhibit 'C.' "

Mr. LYON.—I want you to make your measurements and put them in with the stipulation; it all can come in at one time.

Redirect Examination.

Mr. TOWNSEND.—Q. Counsel on cross-examination interrogated you in regard to a pump near San Mateo, I believe, which met with difficulty and was taken out. Do you know what that pump was, whose structure it was?

A. It had the name of P. K. Woods.

Q. Do you know what the cause of its being removed was and ceasing operations suddenly?

A. The reason for its taking out I simply have from hearsay, and from looking at the parts. I was told it was taken out because the shaft broke and that—

Mr. WHITE.—Just a minute. That is objected to, your Honor. He stated that the bearings were worn out, and he has given his testimony as to the effect of that. This is just hearsay.

The COURT.—The objection is sustained.

Mr. TOWNSEND.—Q. Did you see the broken shaft? A. No, sir.

Q. You described, on cross-examination, the

(Testimony of D. J. Conant.)

method of installation in the use of grease and some oil; what is the purpose of that grease?

A. The grease is put there in order to wear in the bearings. Our bearings are cast iron. The grease is put there, particularly the graphite grease, to form a film on the bearing which will prevent further action of the shaft on the bearing. This grease is only put in there for a temporary purpose; the fact that oil is fed from the surface by means of a drip cut—for instance, if you had a 100 or a 150-foot pump, or more, you have several bearings in there; the oil going to the first bearing would take care of that, but by the time the oil got to the bottom bearing, if there was [664] no provision for grease at each bearing, they might be scoured or burned before the oil ever reached there. By providing grease, it does not run out while the pump is being assembled, the grease remains and passes through the bearing when the pump is started up.

Q. What becomes of the grease, if you know, after the pump is started up?

Mr. WHITE.—That is objected to upon the ground that no proper foundation is laid.

Mr. TOWNSEND.—You cross-examined him on that; I want to know if he knows what becomes of it.

The COURT.—You may answer that question “yes” or “no.” A. Yes, sir.

Mr. TOWNSEND.—Q. What does become of it?

Mr. WHITE.—I object to the question unless the witness tells how he knows it.

The COURT.—You may examine him on that, if



(Testimony of D. J. Conant.)

you may desire, you may examine him as to his competency.

Mr. WHITE.—Q. Did you ever see a pump, after it was in operation for a couple of years, disassembled? A. Yes.

Q. Did you ever notice at that time that this grease that was put in there originally still covered the tubes in large quantities, in each one of these tubular sections?

A. I have seen grease on the shaft, and I have seen grease in the tube.

Q. After two or three years' use of the pump?

A. Yes.

Q. That is what becomes of the grease—it stays there: Is that correct?

A. That is what becomes of a portion of the grease.

Mr. TOWNSEND.—Q. Do you know what becomes of the rest of it? A. Yes.

Q. What?

A. The grease which passes through the bearings [665] and which lubricates the bearings, for which purpose it is put there, passes out the drain tubes.

Q. You spoke of the shaft that carries the impeller rotating at high speed: Do you know the average speed of rotation?

A. Approximately 1150 revolutions per minute.

Q. What is the length of the tube sections employed in the Western Well Works pump?

A. A 1/32d of an inch short of 6 feet 4 inches.

Q. What is the average weight of a tube of that sort, of 3 inches in diameter—the approximate weight?

(Testimony of D. J. Conant.)

A. A 3-inch tube would weigh approximately 20 pounds.

Q. Will a Western Well Works pump operate with the tube sections removed? A. Yes.

Mr. TOWNSEND.—That is all of this witness now, your Honor, subject to recalling him to verify the measurements we have mentioned.

Recross-examination.

Mr. WHITE.—Q. Will one of these pumps of the Western Well Works operate without the shaft-enclosing tube for any length of time in the type of wells in which you are putting pumps down in Santa Clara and San Mateo counties? A. Yes.

Q. Did you ever install one of your pumps without any shaft-enclosing tubing?

A. No, sir, not to my knowledge.

Q. But, in your opinion, your device would operate successfully and be an efficient device without this shaft-enclosing tubing in there: Is that correct?

A. Yes, it could so operate.

Q. And efficiently? A. Yes.

Q. And according to good engineering practice?

A. Yes.

Q. And you think that under those circumstances you could recommend it to any one of the farmers down in San Mateo County, or [666] Santa Clara County, as a good pump: Is that a good pump?

A. Yes.

Q. What does it cost to put in these tubes in one of your pump construction, one of the shaft-enclosing tubes?

(Testimony of D. J. Conant.)

A. I cannot tell you, because I have not the cost figures.

Q. What is your estimate of that cost?

A. I have nothing directly to base it on.

Q. Have you any idea of the cost of reaming these hubs or tapering these hubs, machining them—in one of your pump construction?

A. That operation is combined with threading and facing.

Q. What is the cost of it?

A. It adds nothing except the cost of sharpening tools at times for the threading of the ends of the hubs and the facing of them.

Q. What does it cost to ream out the interior ends of the tubes?

A. Probably a matter of 10 cents an end.

Q. What were the means in the Woods pump for protecting the bearings from the action of the water and the sand?

A. Those parts had been broken off the pump at the time I saw it; it had been removed from the well.

Q. But there had been some attempt in the Woods pump to protect the bearings from the action of the water, and the grit, etc.?

A. As secondly installed.

Q. Do you know the cost per foot of this tubing that you use in your construction?

A. I could not tell you at this date, because it has varied a good deal on the market in the past year or two years.

Q. Well, approximately, you could give us the cost, couldn't you?      A. No, sir.

(Testimony of D. J. Conant.)

The COURT.—We will be in recess until two o'clock.

(A recess was here taken until two o'clock P. M.)  
[667]

### AFTERNOON SESSION.

**Testimony of D. J. Conant, for Defendants (Recalled).**

D. J. CONANT, recalled.

Mr. TOWNSEND.—Q. When we adjourned, I had asked you a question in regard to the weight of tube sections employed by you, referring to the 3-inch tubing. Will you tell us the approximate weight of a section of 2½ inch tubing and 3½ inch tubing?

A. 2½ inch tubing will weigh approximately 6 pounds to the foot.

Q. What size tubing is that?

A. Two and one-half inch tubing will weigh approximately 6 pounds to the foot.

Q. Three inch tubing will weigh approximately what?

A. It weighs about 8 pounds to the foot.

Q. Three and one-half inch tubing will weigh approximately what?

A. Between 9 and 10 pounds to the foot.

Q. I understood you to say this morning that your sections weigh approximately 20 pounds.

A. For a section.

Q. Of 3 inch tubing. Do you want your answer corrected with regard to that?

A. That is not correct for a 3 inch tubing.

(Testimony of D. J. Conant.)

Q. That is approximately correct for a tubing of smaller size? A. Yes.

Q. Now, you stated just before closing that the Western Well Works pump was a practical pump with the tube sections removed. Will you state your reasons for that answer?

A. My reasons for stating that the pump was a practical pump with the tubes removed are because it will function with the tubes removed; the bearings which are a part of the combination coupling will support the shaft, give it proper alignment, hold it in place, and the pump will function with the tubing off. However, the pump will not have as long a life under [668] certain conditions of wells without the tubing as it will with them. There are pumps built without tubes, and they are practical pumps. Some wells produce a lot of sand, some produce practically none. Water, itself, will not make a pump impracticable or practicable. It is a question of the action of the stuff that is carried in the water that the tube will keep out.

Q. Referring to the structure of the Layne model, or of the Layne patent in suit, which is Defendant's Exhibit "B," what would you say as to the practicability of such a structure with the tube section which surrounded the shaft removed?

A. The pump would not function with the tube section removed.

Q. What would result by the removal of the sections which are marked 20 in the model Exhibit "B" if they are removed?

A. It would take away the support for the bearings, and the support for the weight of the pump.

(Testimony of D. J. Conant.)

Q. What would happen to the shaft?

A. There would be no means of keeping the shaft in alignment.

Q. Would there be any means of supporting the shaft?

A. No, because you take away the support for the bearings.

Mr. TOWNSEND.—That is all.

Cross-examination.

Mr. WHITE.—Q. In this model of the defendant's device, are the hubs tapered, or do these hubs have parallel sides?

A. The model shows, to the best of my knowledge, that they have sides which are parallel at the start, and taper as they approach the hub, but that would be parallel sides for a matter of approximately  $1\frac{1}{8}$  inches, and then tapering from then on.

Q. Do you know what the fact is in that regard?

A. I have never checked up on that feature, because those were made on [669] the forming tools that the rest of the pumps are made with.

Q. Is it not a fact that at the beginning those hubs were made by the Defendant with parallel sides, that thereafter those hubs were made with parallel sides, and then a taper beginning about  $\frac{3}{4}$  of an inch from the seat, and that now those hubs are made with the tapering beginning at the extreme end of the hub and extending up to the seat?

A. The first two parts of that statement are correct. I don't know the correctness of the last one.

Q. You are the chief engineer of the company?

A. Yes.

(Testimony of D. J. Conant.)

Q. If that last change had been made, would it have been made under your direction?

A. I would have known it had it been made.

Q. And, not knowing of it, I presume you state that that change has not been made: Is that correct?

A. To my knowledge it has not been made.

Q. You would not deny the fact it has been made, though, would you?

A. I could not, without knowing.

Q. In other words, you would not deny the fact that this hub in Defendant's Exhibit "C" is tapered from the extreme end of the hub to the seat?

A. I would have to measure it in order to know whether it was, or not.

Q. By tapering the hub throughout its length, from the seat to the outer edge, would you or would you not get a tighter joint, and insure a tighter joint between the two sections and such hub when the tube section is forced up on the hub?

A. That is a matter of the diameter of the bottom of the hub and the inside diameter of the reamed tube.

Q. Assuming that the interior diameter of the tube section is slightly less than the exterior diameter of the hub, say a quarter or an inch from the end of the hub, and that the tapering [670] continues from that point on up, would you get a tighter fit by such tapering, than where the hub is only tapered  $\frac{3}{4}$  of an inch from the seat?

A. You would have the same condition in both cases.

Q. In other words, a tapered hub from one end to the other would have no different effect on the tightness of the joint than a hub which was tapered only

(Testimony of D. J. Conant.)

$\frac{3}{4}$  of an inch from the seat?

A. No, since the tube does not ride on that taper in every case until it gets within a quarter of an inch of the shoulder.

Q. In other words, in actual construction, you know it is an actual fact that the tube section does not ride on the taper until it gets within a quarter of an inch of the seat?

A. I made the statement this morning that  $\frac{3}{8}$  of an inch was our outside limit; if they ride on the seat before they came  $\frac{3}{8}$  of an inch they were too small.

Q. Are you willing to state that in your construction the tube section does not ride on the taper until the end of the tube gets within  $\frac{3}{8}$  of an inch of the seat?

A. It is not the common occurrence. You might find an isolated case where you would get a certain tube section that would do that, but that is not common.

Q. How do you know that, when you are not able to give the dimensions of this seat, the dimensions of the hub, and the dimensions of the interior diameter of your tube?

A. For the reasons that the tubes are made on certain tools which are only changed as a matter of five or six weeks' operation—there may be a couple of three hundred tubes made without a change in those tools. The same thing applies to hubs; and the only means I have of detecting them is not with gages in which we measure in thousandths of an inch, but by [671] seeing, placing new tubes over the hubs, how far down they will go.



(Testimony of D. J. Conant.)

Q. Is it not a fact that in the construction of the defendant the tube begins to ride, bear on the tapered hub halfway up the hub, that is, at a point halfway between the seat and the end of the hub?

A. I cannot recall a case where I have seen that.

Q. Isn't that true in all the cases in regard to your construction? A. What do you refer to?

Q. That such a contact takes place halfway between the end of the seat and the hub? A. No.

Q. Isn't that a fact with respect to the pump supplied to the party running the Selby ranch at San Mateo county, that is, that such a contacting takes place between the tube and the hub halfway between the end of the hub and the seat?

A. I cannot answer that question; first of all, I don't know the man's name that runs the Selby ranch, because we have not dealt with it as the Selby ranch; we dealt with it under the man's name, and I don't know who runs the ranch.

Q. Do you know a man by the name of Sherrer?

A. Yes.

Q. Do you know the pump that was supplied Mr. Sherrer?

A. As I recall, three pumps Mr. Sherrer had. The exact conditions on those pumps I could not say.

Q. You are not prepared, then, to say that in those pumps this contacting did not take place halfway between the end of the hub and the seat on the hub?

A. I cannot say positively what happened in that individual pump. What I was referring to are the tests which I make occasionally in going over the

(Testimony of D. J. Conant.)

product going out of the shop; not the parts which enter into a specific pump. [672]

Q. Did you telephone Mr. Sherrer yesterday noon in regard to plaintiff's counsel and their representatives going to his place and examining that pump that your company supplied him?

A. I have not talked with Mr. Sherrer nor seen Mr. Sherrer for probably a matter of probably six weeks.

Q. Were you present yesterday when anyone in your office telephoned to Mr. Sherrer? A. I was.

Q. Protesting against any such examination?

A. I was not.

Q. You don't know anything about that, then?

A. No.

Q. Do you know anything about the pump which was supplied to Mr. Sherrer, located at Palo Alto—supplied to him within the last six weeks?

A. I don't recall a new installation for Mr. Sherrer within the last six weeks.

Q. You are not prepared, then, to deny that in a pump construction supplied to Mr. Sherrer within the last two months a contacting took place between the end of the tube and the mid-section of the hub, when the tube is shoved up onto the hub: That is correct?

A. I can't say exactly what happens. It is possible in taking these tubes, there are so many tubes sent out, and so many hubs, that you could in an instance or two get that. The entire run of the hubs would not be that way.

Mr. WHITE.—That is all.

(Testimony of D. J. Conant.)

Redirect Examination.

Mr. TOWNSEND.—In regard to these Sherrer pumps just referred to, are those supplied with drain tubes at the bottom?

A. All of our pumps are supplied with drain tubes at the bottom. In this case, that is referred to particularly as No. 17.

Q. What effect, if any, would the contacting of the end of the tube section with a tapered hub have with respect to the entry of water from the column?

A. It would simply determine the [673] quantity of water that could go through.

Q. Is there any difference in principle whether the tapering extends for a greater or less length on the hub?

A. No, since it is a straight bore and the tube fits over it, and the tube would ride the taper at the same point.

Q. Does the tapering of the hub have any advantage in the matter of assembly of the pump?

A. Yes.

Q. In what way?

A. The tube and the hub are not uniform in size. They are a matter of a few thousandths of an inch one way or the other. By means of this taper, you can more readily center the tube than if it were straight and had this same variation in size.

Mr. TOWNSEND.—That is all for the time being. Our gages have not come yet.

Mr. LYON.—We have Mr. Anderson in the room in attendance, and, if it please the Court, we would

(Testimony of C. C. Anderson.)

like to interrupt with him. He is the witness we reserved.

Mr. TOWNSEND.—We have not finished our case.

Mr. LYON.—We understand that. This is Mr. Anderson, whose testimony we reserved.

**Testimony of C. C. Anderson, for Plaintiff.**

C. C. ANDERSON, called for the plaintiff, sworn.

Mr. LYON.—Q. Where do you reside, Mr. Anderson?

A. At Linden, near Linden, on the Anderson-Baingrover ranch.

Q. That is near Stockton, is it? A. Yes.

Q. On that ranch, have you any Western Well Works pumps? A. Yes.

Q. And you have one of the Layne & Bowler Corporation pumps, have you? A. Yes.

Q. For what was that Layne & Bowler pump substituted?

A. For a [674] Western Well Works pump.

Q. Do you know of the substitution?

A. Yes.

Q. How long had that Western Well Works pump been used in that well prior to the substitution therefor of the Layne pump?

A. Why, about two seasons—a little over two seasons.

Q. What was its condition at the time that it was withdrawn from the well and said substitution made, as regards its position when it was inserted in the well?

(Testimony of C. C. Anderson.)

A. Well, so far as I was able to observe, it was in pretty much the same shape.

Q. Had there been any changes of any kind made in it during that time?

A. None other than the Western Well Works' employees made in it.

Q. They themselves, had entire charge of the pump during that time, had they?

A. Yes; all work was done by them.

Q. I will ask you to step down here and look at Plaintiff's Exhibit 4, and I will ask you if you can identify it. A. I think that is the pump.

Q. The one that the Layne & Bowler Company took out of the Anderson-Barngrover well, to which we have referred?

A. To the best of my knowledge it is the same construction.

Mr. LYON.—That is all; you may cross-examine.

Cross-examination.

Mr. TOWNSEND.—Q. What representations did Layne & Bowler make to you when they wanted to make this substitution?

A. Why, not anything that I recall now; it was not sold to me direct; it was sold by the firm in San Jose.

Q. I mean when the Layne & Bowler Company took out the Western Well Works pump and put in the Layne & Bowler pump, do you know what representations were made as to the substitution, or the reason for it?

A. No, I do not. The rumors were,— [675]  
nobody made any such statement to me—that they

(Testimony of C. C. Anderson.)

intended to bring suit, but personally nobody made any representation to me.

Q. The negotiations were all carried on in San Jose?      A. Yes.

Mr. TOWNSEND.—That is all.

**Testimony of N. T. Bradford, for Defendant.**

N. T. BRADFORD, called for the defendant, sworn.

Mr. TOWNSEND.—What is your occupation, Mr. Bradford?

A. Selling agent for the Western Well Works, Inc.

Q. What territory do you cover?

A. San Joaquin Valley.

Q. With headquarters where?

A. Terra Bella.

Q. Near what large city is that?

A. About half way between Fresno and Bakersfield.

Q. How long have you been with the Western Well Works, Inc.?

A. Since the early part of 1916.

Q. In the same capacity?      A. Yes.

Q. Are you familiar with the construction of pumps sold by the Western Well Works, and here-in claimed to be infringements?      A. I believe so.

Q. You say you believe so. Will you explain a little more fully why you believe so.

A. I am familiar with the product since they built their first pumps, and have been receiving

(Testimony of N. T. Bradford.)

pumps ever since, and would have noted any change in construction.

Q. Do you do any installation work?

A. A good part of it, yes.

Q. How many pumps of the Western Well Works came under your observation during your connection with them, approximately?

A. Something over 100.

Q. Regarding the installation, have you participated in any considerable number?

A. I have been on the job, I think, on every installation but perhaps ten. [676]

Q. Will you describe the method of installation that has been commonly employed with Western Well Works pumps, and I will call your attention to the model which is here in evidence as Defendant's Exhibit "V"?

A. The suction pipe is installed in the well first, by means of a derrick, and winch, a cable and block; the bowls the then connected to the suction pipe and lowered down to the top of the well casing. A section of discharge column, tubing and shafting, tied together by means of a rope, and raised by a pair of elevators is suspended over the bowls, and the shaft untied and screwed into the tube coupling; a small amount of graphite grease is placed directly above the shaft bearings, and a handful, I would say, of Arctic cup grease is placed above that; the seat for the tubing is covered with white lead; the tubing is put into position, the pipe is lowered in place.

Q. When you speak of the tubes being put in

(Testimony of N. T. Bradford.)

position, will you explain that more fully?

A. The rope is untied that has been holding the tube up, and the tube is lowered down over the hub.

Q. You are referring to a tube section being lowered over the hub, with a combination coupling?

A. Yes. That operation is performed for as many joints of the pump as there are. At the top the head is inserted.

Q. In placing the tube sections in position over the hubs, what care, if any, do you exercise?

A. In so much as the tubing varies in size, the installers sometimes become careless and drop a tube, or when they slide out of the rope sling let them fall; certain tubes that will do no damage, they will tighten up on the hub before reaching the shoulder; other tubes, being looser, go clear to the shoulder, and with the strain of a [677] certain pump hanging on the combination coupling, I have had couplings broken by the jar of the tube falling.

Q. You spoke concerning white lead around the joints formed between the end of the tubing where it slipped over the hub. What is the object of that white lead?

A. It prevents the tube casing member from corroding with the hub member.

Q. Are you familiar with the operation of this pump after it is suspended in the well?

A. I am.

Q. Will you describe its operation, and describe it from the time you have assembled it as a new pump?



(Testimony of N. T. Bradford.)

A. At the time the pump is started, we have grease at all the bearings as they are installed; nevertheless, for the first day or two we run in what would be an excessive quantity of oil to properly work in the bearings, later cutting that down to perhaps 10 ounces in twelve hours or twenty-four hours. Just what do you mean by the operation?

Q. I mean the operation of the pump when the shaft starts rotating for pumping purposes. What action takes place, if any, inside the tube sections, and what action, if any, takes place outside?

A. When the pump is started, the shaft driving the impeller raises the water to the surface; the shafting running through the bearings, with this spiral groove, forces the lubricant down through the pump, supplying all the bearings with lubricant, and there it is expelled at the drain tubes at the bottom.

Q. Where is that lubricant expelled as it passes out the drain tube? A. Into the well proper.

Q. Outside?

A. Outside of the pump assembly.

Q. Outside of the casing? A. Yes.

Q. What method or sort of lubrication is employed after the pump is started in operation?

A. We use a vegetable emulsifying [678] oil.

Q. How is that applied, and how does it act?

A. That is applied with a sight feed, gravity drop oil cup, feeding at some point or points inside of the tube line, with the drip or moisture that is forced around the ends of the tubes, and runs out at the drain tubes in a white or emulsified form.

Q. Have you ever had opportunity to observe

(Testimony of N. T. Bradford.)

the discharge from the drain pipes?

A. Only on one occasion.

Q. Describe the circumstances.

A. This pump was installed in a pit, and it was possible, by going down the pit, to observe the lubricant running from the drain pipe, with about ten feet of lamp cord below the bottom of the pit.

Q. That would be a case, I suppose, where the drain pipes were exposed above the surface of the water in the well?

A. The water is below the bowls of the pump.

Q. You say that was an installation in a pit?

A. Over a pit. There was a pit where this pump is now installed.

Q. What was the condition of the discharge from these drain tubes as you saw it there?

A. In what way?

Q. What was the nature of the discharge?

A. The tubes were dripping a small quantity of white fluid, probably at the rate of one or two gallons a minute.

Q. I understand you that was the emulsion of the water and emulsified oil that was admitted at the top?

Mr. LYON.—We object to that as leading and suggestive.

The COURT.—Yes.

Mr. TOWNSEND.—I was only summarizing.

A. I could not answer that, because I did not collect any of this fluid.

Q. You spoke of the heavier grease being discharged after the pump [679] started in opera-

(Testimony of N. T. Bradford.)

tion. Have you ever seen any evidence of such a discharge as that? A. I have.

Q. When, and where, and under what circumstances?

A. On removing certain installations that were made this spring the grease had been forced out of the drain tube, and as the pump bowls were brought from the well this grease, in the form that it came from the drain tubes, was on top of the bowl.

Q. Outside of the pump proper?

A. Laying on the outside of the pump column.

Q. What was the condition of the pump at the time you saw the milky fluid in the pump installed in the pit? Was the pump working?

A. The pump was running.

Q. How long had it been running, do you know?

A. Two or thre yeods.

Q. Will you please state what effect, if any, the rotating shaft of a Western Well Works pump will have on the bearings, or on the tube section, and the connections with the bearings of the hubs?

A. The rotated shaft, working against the spiral of the bearings in the combination coupling, exerts a certain amount of power and tends to drive and force downward the lubricant that is inside of the tube line. The shaft vibration would tend to keep the tube line from making a permanent seal over the hub of the combination coupling.

Q. And the result of that keeping that seal open would be what?

A. Would allow a small quantity of water to pass through and into the tube line on certain joints.

(Testimony of N. T. Bradford.)

Q. Where would that water come from?

A. It would come from between the discharge column and the tube casing, itself.

Q. Have you ever had any occasion, during your experience with the Western Well Works pumps, to employ a stuffing-box at the top bearing?

A. Three times I have had pumps shipped to me and [680] have put on stuffing-boxes.

Q. Will you state the instances in which you applied stuffing-boxes?

A. The first plant was the Armstrong plant at Early Mart; after starting the pump up the water leaked at the surface at the end of the tube line, and spilled over the pump. The party did not wish to allow us to pull the pump at that time, and I put on the stuffing-gland and kept the stuffing-gland on until such time as we did pull the pump and test out certain combination couplings which had sand holes, allowing a direct communication between the discharge column of water and the tube line, in an amount greater than could be taken out by the drain pipe.

Q. That first installation, was that pumping against a head or was it a surface discharge?

Mr. LYON.—We object to counsel leading the witness.

Mr. TOWNSEND.—I am asking an alternative, pumping against a head or a surface discharge.

A. The head was above the level of the ground by six feet.

Q. What was the second instance that came under your notice?

(Testimony of N. T. Bradford.)

A. The second instance was the Higby plant, at Delano, which leaked water at the same place, and we employed a stuffing-box on that until such time as we could change the couplings, and at that time we put in couplings with spiral grooves, and after this change we were able to take the stuffing-box off.

Q. On this Higby plant, was that against head, or was it a surface discharge?

A. The head was perhaps four feet above the ground level.

Q. In regard to that Armstrong installation, after you replaced the defective bearings with good ones, did you employ the stuffing-box further?

A. No; the stuffing-box is not on the pump. [681]

Q. I understand that is the same situation with regard to the Higby? A. Yes.

Q. Now, what was the third?

A. The third pump to be equipped with the stuffing-box was the Ball & Emery Orchard Co., at Porterville, a considerable head above the surface of the ground, and we put on the stuffing-box thinking we might need it; this stuffing-box was never needed, and was subsequently taken off.

Q. On all of these pumps, the Armstrong, Higby and Ball & Emery, did these pumps have drain pipes such as shown in the Western Well Works pumps, or not?

A. Every Western Well Works pump I ever saw had drain pipes.

Q. Have you ever pulled any Western Well Works pumps? A. Quite a number.

Q. Have you ever observed the condition of the

(Testimony of N. T. Bradford.)

connections between the sections and their hubs?

A. After the tubes are taken apart, they are always comparatively loose fits.

Q. Will those disassembled tube sections and hubs show evidence of white lead here? A. They do.

Q. What is the condition of that white lead?

A. Practically the same as the time it was put on. It had not hardened.

Q. Have you ever been able to use the same old tube sections over again after they have been taken out?

A. We do use the same tubes.

Q. When you put them back, what is the usual condition of the fit of these old tubes on the hub sections?

A. They will usually run right to the shoulder by their own weight.

Q. Would you say the fit is such as to exclude any water entering from the discharge column into the interior of the tube?

Mr. LYON.—We object to that as grossly leading.  
[682]

The COURT.—I think you may answer.

Mr. LYON.—Exception.

A. I do not think the fit is such as to exclude the water.

Mr. TOWNSEND.—Q. In reassembling the old pumps which you have taken out, do you use grease around the bearings?

A. Sometimes we do, and sometimes we do not.

Mr. TOWNSEND.—That is all.

(Testimony of N. T. Bradford.)

Cross-examination.

Mr. LYON.—Q. At this Early-Mart well, you say the party did not wish you to take down the construction at that time, and for that reason you put a stuffing-box on the pump. Is that correct?

A. Yes.

Q. And afterwards you pulled that pump and found that there were sand holes which permitted direct connection of the water from the discharge casing into the shaft-enclosing tubes, did you?

A. Yes.

Q. What did you do then?

A. The first thing we did was to put on smooth on.

The COURT.—What?

A. Smooth on, or cast-iron cement.

Mr. LYON.—In other words, you filled up all of these holes where the water was going through the shaft-enclosing tube, did you? A. Yes.

Q. That was what you did to make the pump operate correctly, is that it?

A. Yes, there was an excessive quantity of water passing through those holes, so we plugged them up.

Q. And you shut out all possibility of sand getting into the shaft-enclosing tubing by closing up those holes. Is that it?

A. Stopped any possibility of sand coming through at that point, yes.

Q. Where else did the sand get through?

A. It might at the [683] end of a tube.

Q. Did you ever know of it going through there?

A. I do not.

(Testimony of N. T. Bradford.)

Q. As a matter of fact, you use the tube to prevent sand going through at that juncture and cutting out the bearings of the pump, don't you?

A. I would say so.

Q. Then the object of the shaft-enclosing tubes is to prevent the water being pumped from carrying any sand into the bearings. Is that correct?

A. One of the reasons.

Q. That is the principal reason, is it not?

A. No, I would not say it is the principal reason.

Q. What other reason, in your conception of this pump, is there for the shaft-enclosing tubing?

A. To provide a means of lubrication.

Q. In other words, provide a conduit down which the oil may be conducted from one bearing to another down the column. Is that it?

A. The lubricant?

Q. Yes—this emulsifying oil, just what is that?

A. You will have to ask somebody that knows more about it than I do; it is a preparation that we buy from the Standard Oil Company, which makes a lubricating fluid when mixed with water.

Q. Have you ever been in the shop of the Western Well Works?     A. A great many times.

Q. They use the same compound on their thread-cutting machines, don't they?     A. I don't know.

Q. Isn't that the Standard Oil Company's standard thread-cutting compound, that you call your emulsifying oil?

A. I used Standard oil thread compound.

Q. That is your emulsifying oil that you speak of?     A. Yes.



(Testimony of N. T. Bradford.)

Q. When you assemble one of these new pumps as you have described, you first put a quantity of graphite grease just above [684] the bearings on the shaft. Is that correct? A. Yes.

Q. Then you smear on a quantity of No. 5 standard cup grease. Is that correct?

A. That is correct.

Q. And above that, after you have assembled it, you pour into the top of that section a quantity of oil? A. Not every section, no.

Q. Practically every section? A. No.

Q. How often?

A. My instructions to the installer are every fourth joint pour some oil in.

Q. How much do you pour in at every fourth joint, according to your personal instructions?

A. Perhaps half of a tomato can full.

Q. Did you have anything to do with the installation of the pumps on the Selby ranch for Mr. Sherrer?

A. I don't know the Selby ranch or Mr. Sherrer.

Q. Or recently on a ranch at Palo Alto for Mr. Sherrer? A. I did not.

Q. Known as the White Oaks? A. No.

Mr. LYON.—That is all.

Mr. TOWNSEND.—Nothing further.

**Testimony of Stanley H. Halstead, for Defendants.**

STANLEY H. HALSTEAD, called for the defendants, sworn.

Mr. TOWNSEND.—Q. Mr. Halstead, please state your age, residence and occupation.

(Testimony of Stanley H. Halstead.)

A. I am 39 years of age; I live at San Jose, California. I am an officer and one of the directing heads of the Western Well Works, Inc., whose business is the manufacture of turbine pumps, well drilling machinery, the installation and equipping of wells for municipal service, industrial service, and irrigation service, and the corporation [685] does also some job work at times.

Q. Are you familiar with the pump manufactured by your company? A. I am.

Q. Its construction? A. Yes.

Q. And operation? A. Yes.

Q. I show you a patent and ask you if you know what that is. If so, please state to the Court what it is.

Mr. LYON.—Wait a minute. The patent speaks for itself. It is a patent pleaded in your answer as the one under which you allege you are operating. Offer it in evidence. The witness cannot add anything to what it shows in that regard. It is incompetent.

Mr. TOWNSEND.—Q. Are you, Mr. Halstead, the patentee therein mentioned? A. I am.

Q. Have any pumps been manufactured according to this patent?

A. They have. All of our pumps.

Q. What is that?

A. I say all of the pumps we turn out are manufactured under that patent.

Q. All of the Western Well Works pumps are manufactured under this pump? A. Yes.

(Testimony of Stanley H. Halstead.)

Mr. TOWNSEND.—I offer this patent as Defendants' Exhibit "W."

(The patent is marked "Defendants' Exhibit 'W.'")

Q. Are you familiar with the Anderson pump which plaintiff has introduced in evidence as their Exhibit 4?

A. Only in so much as it represents our standard construction at the time that pump was sold.

Q. Do you know about the sale and installation of that pump? A. I made the sale myself.

Q. Do you know when that was?

A. It was early in 1916, I think January or February. I have refreshed my memory as to [686] the date of the contract—in fact, it was not a contract; it was simply a letter ordering it, ordering five of those pumps at one time, to be delivered throughout the season.

Q. Do you know what condition that pump was in when it was sold by the Western Well Works to the Anderson-Barngrover Co.?

A. It was a new pump.

Q. And its condition otherwise, as to the fit of the tube sections with respect to the hubs.

A. The fit of the tube sections of course I did not inspect. It had the same standard of taper on the hubs as we were using at that time.

Q. Do you know who installed that pump?

A. The installer of those pumps was a man by the name of Benjamin Sperry.

Q. You have heard Mr. Folsom state that they had been installed under his supervision.

(Testimony of Stanley H. Halstead.)

A. Yes, they were installed the second time under his supervision; not the first time.

Q. When you say installed the second time, what do you mean?

A. They ran the full season of 1916 in wells which were comparatively shallow; but during the fall or winter, I have forgotten which, they informed me that they wanted to deepen the wells, they were not getting enough water; in fact, the pumps were previously designed for a small quantity of water; when they got ready to deepen the wells they sent down to send up crews so as to pull out the pump so as to deepen the well. At that time we sent Mr. Folsom up on the job. He was not in our employ at that time, he was simply loaned from an electrical concern in town with whom he was associated at that time.

Q. What did he do to the pumps when he pulled them at that time?

A. Just exactly what he did with the pumps, I don't know. Presumably, he pulled them out and laid them at the side of the well, [687] because that is the normal procedure.

Q. Do you know if any replacements were made at that time on the pumps?

A. No replacements to my knowledge, that I can remember, distinctly, now; it seems to me before they were put back—

Mr. LYON.—We object to this as incompetent; the witness don't know; he can't speculate on it.

Mr. TOWNSEND.—Q. Would you have known if any changes had been made?

(Testimony of Stanley H. Halstead.)

Mr. LYON.—We object to that as leading and suggestive. We do not contend that any changes were made by him. We are willing to stipulate with you there were no changes made.

Mr. TOWNSEND.—The same tube sections and parts went back into the pump the second time it was put back into the well?

Mr. LYON.—We are only concerned with what is here now.

Mr. TOWNSEND.—With this understanding, that these tube sections were used again in the re-installation, I have no further examination.

**Cross-examination.**

Mr. WHITE.—Q. The pump construction, Mr. Halstead, in the patent referred to here, Exhibit "W," embraces hubs each having parallel sides and not tapered sides. Is that correct?

A. I did not notice the patent showed parallel sides.

Q. Look at the drawing of the patent and state what it shows in that regard, whether these hubs have parallel sides or tapered sides.

A. As drawn in the specifications, they apparently show a straight side, though that feature was not taken into consideration when I took out the invention.

Mr. WHITE.—That is all. [688]

**Testimony of E. P. Lesley, for Defendants.**

E. P. LESLEY, called for the defendants, sworn.

Mr. TOWNSEND.—Q. Will you please state your residence and occupation.

(Testimony of E. P. Lesley.)

A. My residence is Stanford University, Campus, Stanford University; my occupation is professor of mechanical engineering at Stanford University.

Q. What field does your faculty connection cover?

A. Rather a broad one. I have general supervision of all courses dealing with machine construction, of course machine-shop practice, foundry—

Mr. LYON.—We will admit the qualifications of this witness generally as an expert, only requiring such qualifications as are required as to any expert testimony that he is going to give; in other words, if he is going to testify to anything with regard to specific features or structures, we want his foundation on that particular structure shown. If he is going to testify to any of the defendant's structures, we want to know what he knows about those.

Mr. TOWNSEND.—Just tell us, in answer to counsel's suggestion, Mr. Leslie, what experience, practical or otherwise, you have had qualifying you in hydraulic engineering, with reference to pump construction.

Mr. LYON.—Bring him down to what he knows about defendants' pumps. We admit he is qualified in regard to hydraulic engineering.

Mr. TOWNSEND.—Q. Touching upon the subject that counsel is most anxious about, give us your knowledge of the structures here in controversy.

A. With respect to the defendant's pump, I have been familiar with it for about two years. In the past year, I have been [689] retained by them in

(Testimony of E. P. Lesley.)

an advisory capacity, and I have watched operations in their shop, have examined their pump, and I have superintended the installation of one pump at Stanford University; I have recommended with reference to the pressures of pumps—not always that pump—in that time, both for Stanford University and for other clients; I have tested the pumps as manufactured by the Western Well Works, making observations to determine the functions of various component parts.

Mr. TOWNSEND.—Does that satisfy you, Mr. Lyon?

Mr. LYON.—I don't know what you want to prove by this witness. I wanted to shorten this all I could, in regard to his qualifications.

Mr. TOWNSEND.—Q. Are you familiar with the plaintiff's patented structure? A. Yes.

Q. I mean of the plaintiff's patent in suit?

A. Yes.

Q. I show you a model which is marked "Defendants' Exhibit 'V'" and ask you if you know what that is.

A. Yes. That is a model of the Western Well Works pump, as manufactured by them at their plant in San Jose.

Q. I show you a model which is marked "Defendants' Exhibit 'B'" and ask you if you know what that is.

A. That is a model of the construction as shown by the drawings and revealed in the specifications of the Layne patent, the number of which I cannot recall to mind.

(Testimony of E. P. Lesley.)

Q. Of the patent here in suit?

A. The patent in suit, I understand.

Q. State whether you have had anything to do in connection with the construction of these models, or either of them.

A. I have had general supervision of them, making suggestions as to the materials to be employed, size of the models, and so on, [690] which might show what was desired.

Q. Who carried out your instructions generally?

A. Mr. Conant.

Q. Who has already testified?

A. I believe so.

Q. Are you familiar with the plaintiff's patent in suit? A. Yes.

Q. Will you state how this model, Defendants' Exhibit "B" of the Layne structure, compares with the Layne patent in suit?

A. Except in certain features that appear to me unessential, they are as near as practicable, as disclosed by the drawings and specifications.

Mr. LYON.—We are willing to stipulate that it is a substantial compliance with the drawings of Figure 1, that is the preferred form, and with such changes as have been made, which would be obvious to the ordinary mechanic upon the face of the drawings, if counsel for the defendants is equally willing to so stipulate.

Mr. TOWNSEND.—Thank you.

Mr. LYON.—Do you so stipulate?

Mr. TOWNSEND.—I do. It is a very fair statement.



(Testimony of E. P. Lesley.)

Q. Please briefly explain to the Court the construction and mode of operation of the pump mechanism shown and described in the Layne patent in suit, making such references as you desire to the model of the Layne structure, Exhibit "B."

A. If I may go a little closer to it, the model shows a pump bowl, a shaft surrounded by an enclosing casing, a discharge column, and a representation of a pump head; the shaft and its enclosing casing are in sections, the weight of each section of shafting is borne by a thrust bearing; the sections are—

Q. (Intg.) Give the numbers as you go along.

A. The thrust bearings or support collars are numbered 48; the shaft-enclosing casing sections are numbered 20. In operation the pump would [691] be driven through a sectional line shaft from the top, turning the impeller, which is numbered 38, and by centrifugal force driving the water up the discharge column, No. 23, and delivering it to the surface of the ground.

The COURT.—You mean 23?

A. 23, yes. A lubricating feature is provided, in that the shaft-enclosing casing is made substantially tight against the entrance of water from the well or from the bowls No. 21, against the entrance of water from any point—water or anything that the water might carry with it; means are provided for tightening this tube, substantially sealing it off, both at the bottom and at the top. A stuffing-box, on which I find no number, is provided at the bottom; packing is arranged at the bottom. The

(Testimony of E. P. Lesley.)

stuffing-box is also provided with a top, and in conjunction means is provided for tightening the glands of the stuffing-box, which, of course, cannot be reached from the surface of the ground; that is the tube No. 44, which has at its lower end a sprocket which engages—a sprocket of which there are three, carrying a sprocket chain—the design appearing to be if this tube is rotating, all three stuffing-box bolts would be turned down and tightened at the same time; the stuffing-box gland at the top is the ordinary form with only two bolts. As disclosed in the patent drawings, there is a pipe No. 52 which is described as an air vent; the part marked No. 44 is also a tube, and is provided with a hole into the chamber 47. It is stated in the patent specifications that this whole interior of the shaft casing may be filled with oil; no water can leak into it; there is no other place for the oil to leak out. It is sealed against water at the bottom, it is sealed against oil leaking out; the lubricant may be used for such time as is necessary, until it shall have become spent [692] or worn out, and then that air pressure may be applied to the air pipe, 52, and the oil forced down and into the hole in pipe 44 and upward and out one of the openings that are provided at the top, or that the operation may be reversed, and air may be forced in at the top, thus forcing the oil upward and out of the pipe 52. It may be noted that constructed as is this model, substantially the same as revealed in the drawings, the thrust collars No. 48, 48' and 48'', since they bear the weight of the member 48 of the

(Testimony of E. P. Lesley.)

shaft and impeller below No. 48', and the sectional shaft and so on, would, with their seat upon the bearings, which they are threaded in between the top section of the model, form in some degree a seal holding oil above each of the bearings; in time, of course, that operation, if there were an oil film in there, a certain amount of oil would gradually seep through and would as fed from the top finally fill up the entire chamber. Auxiliary devices, in the form of a wedge mechanism, parts No. 33, with sliding collars, 31 and 28 and connecting rods and toggle links, are provided, as stated by the patent, to secure this mechanism within the well. The weight of the pump bowls, and of the runner, and of the shafting is supported by the shaft-enclosing casing sections, 20, in this particular model, which I should say is substantially correct with the drawings; the weight of the discharge casing, or discharge tube, 23, is also supported by the tube line. As to the lubricating feature, this pump provides what may be termed a stagnant system of lubrication; the lubricant introduced by some means into the tube is held there until it becomes spent. There appears no way by which it can be continuously fed. It is simply held as lubricant might be in the crank case of an automobile; it is filled up [693] and it wears out or is burned out, dissipated. That seems to me as much of a description as I can give.

Q. Can you describe the shaft line construction and method of assembly?

A. The method of assembly as shown in this model, and as shown in the drawings and described

(Testimony of E. P. Lesley.)

in the specification is to provide a sectional shaft, with what I have before termed a transverse collar, 48, and the separate sections of the shaft, as I stated, the weight of which is borne by its own individual bearing. The shaft has an extensible feature, in that there are splined or keyed fits, loose-sliding keys, so that each end of the shaft may be lifted without lifting the lower portion.

Q. In the Layne structure to which you have just referred, state what would result if you removed the shaft casing, 20.

A. The whole apparatus would fall in the well.

Q. I show you a patent of the Crannell patent, Defendants' Exhibit "G," and ask you if you are familiar with it—the Crannell patent No. 425,933.

Mr. LYON.—That and all subsequent questions addressed to this witness in regard to the prior art, or anything of that kind, will be understood as subject to our objection and exception in regard to estoppel?

The COURT.—Yes.

Mr. LYON.—Without the necessity of repeating it.

Mr. WHITE.—I will ask that opposing counsel stipulate at this time, to save the necessity of proving the same, that this Crannell patent has been before the other court, the Courts of Appeal in all of these prior cases.

Mr. TOWNSEND.—That is true. In the Getty case it was used to limit the patent; the Crannell patent was held to be a substantial anticipation.

(Testimony of E. P. Lesley.)

Mr. LYON.—There is no use of stating that.

Mr. TOWNSEND.—I wanted to bring before the Court the facts, so that these decisions may be properly surveyed.

Q. Just explain this Crannell patent, with particular reference to the parts which are numbered 1, 2, 3, 4, 5 and 14 of Figure 3 of the drawing.

A. Figure 1 shows a shaft-enclosing casing; Figure 2—

Q. (Intg.) Pardon me: You say Figure 1 of that, you are referring to numeral 1 and also to numeral 2?

A. Figure 3, No. 1 shows a shaft-enclosing casing; No. 2 shows what is termed in the patent a cylinder which corresponds to the pump bowl of the patent in suit, No. 21. No. 3 shows what is called a diaphragm plate forming a closure between the pump bowl and the shaft-enclosing casing. No. 4 is termed in the specification an aperture through which the shaft may pass. The specification states that the shaft is properly packed at this point, that is, at the bottom of the line shaft. No. 5 is the shaft which is surrounded by the enclosing-casing No. 1. No. 14 is the runner or impeller; in this instance it is an impeller of the screw type, not of the centrifugal type.

Q. I show you a copy of the Eisler patent, No. 522,518, which is in evidence as Defendants' Exhibit "F," and ask you if you are familiar with that. A. Yes.

Q. Kindly give us a brief explanation of the construction and operation of the Eisler structure.

(Testimony of E. P. Lesley.)

Mr. LYON.—You stipulate this is also a part of the prior art that was before the court in each one of these cases?

Mr. TOWNSEND.—It is apparent that it was pleaded; it is not apparent from the record what consideration was given to it.

Mr. LYON.—It was offered in evidence in each one of the prior cases; what the Court thought of it we do not know. [695]

Mr. TOWNSEND.—We are now offering our own explanation of it to this Court for original investigation.

A. With respect to the Eisler patent, I had a model constructed, substantially, as nearly as I could make it with the drawings, and it is a little simpler to see the construction from this, if I may use that.

Q. Who made this model that you are referring to, or under whose supervision was it made?

A. The model was made under my supervision, personally, at Stanford University, by a pattern maker there.

Mr. TOWNSEND.—I will ask that this model be now marked "Defendants' Exhibit 'X,' " so that it may be identified in the explanation the witness is about to give.

Mr. LYON.—In order to save time, we will make the formal objection that the offer of the model is incompetent, no foundation laid, and not properly identified or proven, and allow the Court to reserve that objection for ruling until we have afterwards looked at it.

(Testimony of E. P. Lesley.)

A. This is a model of the Eisler patent as disclosed by the drawing, particularly with reference to Figures 1 and 4, and by the specifications which follow on the succeeding pages. There is provided in this structure a column construction which, as the inventor states, is supported by means of four columns, numbered here 6. To these are fastened an outer casing, No. 7, and an inner casing, which is numbered, as in the patent, No. 4. There is provided a shaft, which is suitably supported by bearings, No. 19, No. 23, 18 and 17 in the bottom. These bearings are carried upon floors Nos. 9, 10, 11 and 12, and also No. 8. These floors, as stated by the inventor, are spaced at suitable intervals around the casing [696] to properly steady and line the shaft. The shaft is provided with vertical adjustment by means of set collars, No. 20 and 22, which may be adjusted in position, and thereby the shaft raised or lowered, and fixed in any desired position, and any vertical motion prevented; a further set collar is particularly called attention to at the bottom—over the bottom bearing—which, as the inventor says, is designed to exclude the sand. Between the inner casing, No. 4, which fits into an enclosed shaft and the outer casing, No. 7, are what are called water passages in what we would term the water discharge column, which provides for the passage of water upward as it is impelled by the runner of the pump. The water is drawn into the pump through ports in the side of the outer casing, entering the suction chamber just below the floor, numbered 11. It then passes upward through a

(Testimony of E. P. Lesley.)

central port and by the action of the impeller, which is shown here as No. 17 is forced out the port, out the bottom of the shaft-enclosing casing, into the passage which leads upward. He calls attention to the fact that this casing extends above the outer casing, so that any water that comes up these passages is spilled over here, and not into the casing around the shaft. A lubricating feature, to which he calls particular attention, is provided, a pipe not numbered in this exhibit—I believe the pipe is 26—which has branch pipes, and they are numbered 27, 28, 29, and they lead to the various bearings, even to the bottom-most bearing of the pump. There are shown in the model and in the patent drawings the intercepting plates No. 31; they are shown in section here; they extend inward radially from the corner of the shaft-enclosing casing, extended downward, and are designed to perform a similar function as that of the so-called [697] diffusion vanes of the more modern turbine pump. The inventor states without them the water would probably circulate continuously in there. It appears that he did not know the entire theory of the turbine pump when he made this design. There are provided in this structure three functions, exclusion of water and detritus from the shaft, and positioning and alignment of the bearings for a shaft, and in this case a means for lubrication which is not, in itself, the shaft-enclosing casing.

Q. That last remark I do not understand, with regard to lubrication.

A. I state that the shaft-enclosing casing in this



(Testimony of E. P. Lesley.)

structure performs no function of lubrication. It performs solely the function of excluding water from the space surrounding the shaft—water or what the water might carry with it—and the function of aligning the shaft, since it provides the floors 9, 10, 11, etc., which are stated by the inventor to be placed at suitable intervals for lining the shaft. The lubricating feature is a distinct feature, a separate pipe provided with an oil cup at the top, through which he states oil may be fed, and by which the pump will be properly and continuously lubricated as long as the supply of oil will last.

Q. These lubricating pipes that you referred to, 26 and 27, are they within or without the shaft-enclosing casing?

A. As shown by the drawing, they are within the shaft-enclosing casing.

Q. And also by the model?

A. And by the model; of course, the model is substantially according to the drawing.

Mr. WHITE.—Q. Down here under the water they are inside the shaft-enclosing casing?

A. Only so far as they could be in the shaft.

Q. That is, they extend beyond?

A. They extend beyond the [698] shaft-enclosing casing.

Mr. TOWNSEND.—I show you a copy of the patent to Mr. Halstead, No. 122,870, which is in evidence as Defendants' Exhibit "U," and ask you if you are familiar with that.

A. Yes.

(Testimony of E. P. Lesley.)

Q. State how that compares, if at all, with the defendants' model, Exhibit "V," showing the Western Well Works structure?

A. There appears to me to be substantial identity of function as disclosed by the model and by the drawings and specifications of this patent.

Q. Taking the Halstead patent and the defendants' pump, Model Exhibit "V," will you please explain the mode of operation of the apparatus therein shown.

A. Explain the mode of operation of this model?

Q. Yes. The construction has been referred to more than once in the case, and it is not necessary to go over that, except as you may want to.

A. In operation, this pump is driven from the top, either by a belt connection or a direct-connecting motor, and the runner is rotated; the centrifugal action of the runner drives the water out in the passage of the discharge column, and it is delivered at the surface of the ground, or above the surface, as may be desired. The particular feature of this pump which may need further explanation is the lubricating system. The top, what has been called the top tube bearing No. 11 is provided with holes that are adapted to receive an oil pipe, to which is attached a drip feed oil cup. Oil is fed into a small receptacle, which is channeled in the upper end of the tube bearing member, No. 11, and as the shaft is rotated it is fed and moved by gravity down the shaft-enclosing casing, No. 8, until it reaches a point near the top of the pump, where it may meet, or where it meets a recess that is cored in

(Testimony of E. P. Lesley.)

the part No. 17, in the bearing part of No. 17; [699] here are provided two drain pipes; these are made in this side installation of quarter-inch pipe that is inserted in the mold before casting. These drain pipes are open to the well without the discharge casing, so that lubricant fed and moving by gravity, or fed by other means down the shaft-enclosing casing, runs out into the well at this point. That seems sufficient explanation.

Q. Have you made any tests to satisfy yourself that the mode of operation you have described is correct? A. Yes, I have made a number of tests.

Q. Will you describe the results of your tests, and show the results?

The COURT.—Show the results in what respect?

Mr. TOWNSEND.—As to the operation of the defendants' pump with respect to lubrication.

The COURT.—Is there any question on that, gentlemen?

Mr. LYON.—I don't know what counsel intends to show by this witness. If he intends to show there is no difference between the mode of operation as to lubrication, alignment, etc., of the Plaintiff's Exhibit 4, which is the infringing structure here, we would like to have the foundation laid. I don't know what counsel hopes to prove by this witness.

Mr. TOWNSEND.—Mr. Layne has already described the operation of this Anderson pump.

Mr. LYON.—The description of this model has been given two or three times already, and there is no use to encumber the record.

Mr. TOWNSEND.—Mr. Layne has not shown

(Testimony of E. P. Lesley.)

how the pump works. He has shown some tests he made under staged conditions, out of operation. We are going to show the actual thing that takes place, and I believe it will be interesting to the Court, and [700] conclusively prove the method of lubrication employed, and the method of operation, and the action that takes place in the defendant's pump.

Mr. LYON.—We object, your Honor, on that statement, until there is a foundation laid to qualify the witness. Plaintiff's Exhibit 4 stands before the Court as an infringing structure, and we would like to have the witness qualify with regard to that installation.

Mr. TOWNSEND.—If the witness be permitted to tell what he has done, and what he saw done, and what was done in the operation of the defendant's pumps, his qualifications will be apparent. Until he has told what he did and what was done, we cannot prejudge. I have asked him what tests he made, and how he made them.

Mr. LYON.—We object to that as immaterial, until a further foundation is laid.

The COURT.—I will let him proceed; perhaps that is the shortest way out of it.

Mr. LYON.—If counsel would state what he intends or wants to prove, maybe we would not lose time; maybe we could stipulate to it.

Mr. TOWNSEND.—We want to settle this very matter that is in controversy, as to the matter of leakage and—

The COURT.—As to the matter of leakage, I

(Testimony of E. P. Lesley.)

don't know how that could be settled by any actual experiment.

Mr. TOWNSEND.—I think the professor will show that by visual and by ocular proof.

The COURT.—There is no question but that a device—perhaps I should not say there is no question—could be made, that is, a particular device, so that it leaks. And I may say [701] further there is no question in my mind that it could be made so that it does not leak.

Mr. TOWNSEND.—We have never found a way that it did not leak somewhere along the line. It is apparent that some joints are tighter than others, and that there may be a leakage in one joint and not in the other, but in a long line of pipe we want to show what the leakage is and what it is for. It has a definite function. I think the professor's experience along that line will clear up any matter of doubt that there may be, and any matter of controversy on the point, because it is proof positive, in contravention of the very theory that they have advanced.

Mr. WHITE.—In that respect, they are going to try to prove with respect to some apparatus, that we know nothing about, he found leakage.

Mr. TOWNSEND.—I am going to have him tell you all about it.

Mr. WHITE.—As stated this morning, if your Honor at the conclusion of this testimony has the least possible doubt that in the operation of these pumps sold by the defendant that leakage does not take place, we want to have the opportunity of tak-

(Testimony of E. P. Lesley.)

ing a ride down 35 miles and let you examine pump after pump put in by them; we will have these pumps taken out of the ground, just as they are put in, and let your Honor see whether or not that leakage takes place. There is no question about the fact in our mind. We certainly do not want this case to go off on any such point as that. That is, if your Honor has any doubt about this matter of leakage, we can take you within 35 miles of the courtroom and show you by the actual installations, and not rely on any expert testimony, or tests made by the professor.

Mr. LYON.—We think it would be absolutely incompetent, [702] to show by this witness that he tried something else. We based our entire case in chief upon the production of a particular pump and proof that it was tight. Now, we think that they can take our pump and offer proof that that pump leaked at these joints, or take us to an actual installation and show it there.

The COURT.—Is it your contention, Mr. Townsend, that the witness will testify that a mechanism constructed in the manner in which apparently this one was, with the use of white lead in the joints, cannot be made water-tight?

Mr. TOWNSEND.—Cannot be made water-tight?

The COURT.—Yes.

Mr. TOWNSEND.—That would be perhaps a difficult proposition to prove.

The COURT.—A man who is expert in mechan-

(Testimony of E. P. Lesley.)

ical construction ought to be able to express an opinion about that.

Mr. TOWNSEND.—I think he could express an opinion, and that he will show under working conditions the matter of that being absolutely tight from top to bottom is almost a practical impossibility.

The COURT.—If you intend to show that, you may proceed; but it would be immaterial to show that any particular pump leaked, except perhaps by way of illustration of a general statement of opinion or theory upon his part, that it would be practically impossible to construct a pump in the manner in which this is constructed that is waterproof.

Mr. TOWNSEND.—I think that will be covered.

Mr. LOFTUS.—There is one other point, that the plaintiff's tests have been made of this pump after it was removed from the ground. Here are some tests that the professor made beneath the ground as the pump was actually operating. [703]

The COURT.—With that promise, you may proceed.

Mr. LYON.—We note an exception.

A. I shall have to refer to a memorandum made at the time to get dates, if it is of any importance. On December 29th of last year I watched the installation of a Western Well Works pump at the farm of Mr. E. W. Conant, on Meridian Road, somewhat west and south of San Jose. This pump was installed in a pit.

The COURT.—This was after this suit was commenced?

(Testimony of E. P. Lesley.)

A. Yes.

Q. After you had been employed for the purpose of testifying in the case?

A. I didn't know then—I had been employed by the defendant to make tests.

Q. With a view, I suppose, of qualifying as a witness? A. I understood that to be the case.

The COURT.—Well, you may go into this, I think, gentlemen, although it would not be of very strong evidentiary value.

Mr. TOWNSEND.—I would like to proceed with the development of his results and show those results, and then we will reach the proper question, if you desire.

The COURT.—It seems to me the question has only two aspects: One is whether, mechanically, it is practicable to construct a pump in this manner which would be water-tight, and, of course, it refers to the enclosing of the shaft, and the other would be to prove by going into the country where the pumps were installed in the ordinary course of business and testing them out and showing as a matter of fact, generally speaking, they do leak a substantial amount of water. Now, by this evidence which you are offering, apparently you are doing neither. You are simply having this witness testify as to an installation that was made after the suit was commenced, and it would be [704] very easy, of course, to put it in such a way as to make it leak.

Mr. TOWNSEND.—I think we will show this was a *bona fide* test; there was no frame-up; we would not be a party to any such thing as that.



(Testimony of E. P. Lesley.)

The COURT.—Not necessarily a frame-up.

Mr. TOWNSEND.—I assume the Court of that fact; and I would put on another witness to show how it compares with their universal practice of installation. I will give every opportunity to demonstrate this was an actual test under working conditions.

The COURT.—You have already shown how they were ordinarily installed.

Mr. TOWNSEND.—As a rule, these go down into a bored well, and it is difficult to see what goes on there. Mr. Bradford has told how he in one instance saw the results of discharge where the pump happened to be installed in a pit. Now, these conditions are rare, and it took the installation here in a pit to make these observations under actual working conditions, because we could not send a diver down there, and he could not get in a 10-inch well, anyway, under ordinary working conditions.

The COURT.—You may proceed, but, of course, it is not of much evidentiary value.

Mr. TOWNSEND.—Its weight your Honor will be the judge of.

The COURT.—You may proceed.

A. This pump had a 79-foot discharge column. The pump bowl and the casing which contained the drain tubes were without the bore of the well, so that it could be observed. It was a 9-stage 10-inch pump; 4 of the upper stages were exposed. This pump was started in operation after I had watched its installation, and in that installation I noticed particularly the type [705] of line joints; they

(Testimony of E. P. Lesley.)

were loose; if anything, they were looser than those upon the model. It was an old pump, that is, the column was old. The bowls, top bearing of the pump and the head were new. The rate of the drain pipe discharge I measured with a gallon can there, and found that it was, roughly, a gallon a minute with that particular installation; I took a sample of it after the pump had been in operation some hours. It is in that bottle.

Mr. LYON.—We object to that on the ground it is immaterial, irrelevant and incompetent.

The COURT.—Overruled.

Mr. LYON.—Exception.

Mr. TOWNSEND.—That bottle is numbered, is it?

A. That bottle is numbered 1. It is the drain tube discharge that I collected.

Q. Will you state the revolutions of the shaft, as you observed it?

A. The rate of revolutions of the shaft was 1162.

Q. R. P. M.?

A. R. P. M. The so-called Emulso oil, as furnished by the Western Well Works, was fed at the top of that pump through a drop-feed oil cup at the rate of 10 drops a minute—oil the same as this.

Q. Please mark that bottle 1a, will you?

A. Oil like in bottle 1a, identified particularly by its smell.

Mr. WHITE.—Do I understand you to say the oil in the last bottle came out of the drain tube?

A. No. Oil like that in this bottle 1a was fed at the top bearing. On a later day, in fact on the fol-

(Testimony of E. P. Lesley.)

lowing day, I made some further observations as to the rate of drain tube discharge. We put upon the discharge elbow at the top a gate valve and inserted a pressure gage, and determined under various conditions of operating [706] head that the drain tube discharge varied in quantity. The quantities were as follows: Under free discharge at the top, with a 79-foot head upon the top pump bowl, a gallon in 1.15 minutes; with 8 pounds pressure upon the gage—the gage was placed level with the discharge pipe, substantially at the top of the well—with 8 pounds pressure it was a gallon in 1.01 minutes; with 16 pounds pressure a gallon in 0.92 minutes; with 26 pounds pressure a gallon in 0.79 minutes. After I had measured these rates of drain tube discharge, I drove wooden plugs into the drain tubes so that they could not leak, and I observed that they did not leak; and then ascended to the top of the pit, where I could observe the action of the pump, and noted that in 25 minutes from the time I had driven the plugs in there was a spasmodic discharge of heavy emulsion from the top, occasionally a bubble of air came out; you would know that it came out of the annular space around the shaft at the top tube bearing; I had plugged the drain tubes at 2:25 P. M.; then I left the pump in operation unattended, drove into San Jose, and came back later, and at 5:10 P. M. the water was running out of the top; the drain tubes were plugged.

Mr. TOWNSEND.—Q. Out of the top—what do you mean by that?

(Testimony of E. P. Lesley.)

A. Out of the top of the tube bearing, at this portion here; it was occasionally coming through one of the holes that are provided for the fitting of the oil lead—there are four provided there, and only one was in service for feeding the lubricant; at that time I noted that if we applied any discharge pressure whatever, that could be distinguished on a gage sensitive to half a pound per square inch, a carefully calibrated Stanford University laboratory gage—if we would apply a discharge pressure of as much as a pound per square inch [707] water would come out of the top of the shaft-enclosing casing through the upper bearing.

Q. That is, when the tubes were plugged?

A. When the drain tubes were plugged.

Q. Have you stated in this test how much the dripping was per minute of emulsified oil?

A. Feeding the emulsified oil in these tests at the rate of 16 to 11 drops per minute. Upon examining closely the drain pipe discharge in that bottle, No. 1, it seemed to me that there was little in it but water, so on January 2d I made two further observations; I gathered two more samples, one is in bottle No. 2, which I took from the discharge of the pump at the top of the ground; that is merely water, so far as I know; that was gathered out of the discharge of the pump; I collected another sample of the drain pipe discharge, which is in bottle No. 3.

Mr. LYON.—Q. So far as you have been able to ascertain, those three samples that you have here

(Testimony of E. P. Lesley.)

in these bottles are perfectly and absolutely free from sand, aren't they?

A. I have been able to observe no sand in them, whatever. The well, you understand, is an old and well-developed well; the water coming from the well is clear as a crystal at all times, no sand in it, no sand stirred up by it at all. At the end of these tests that pump was taken out and returned to the Western Well Works shop, and on January 14 another pump was installed. This pump, so far as bowls, so far as the bottom bearing of the discharge column, that has been called the adapter bearing, No. 17, was the same pump except that a new runner shaft was supplied, and an additional bowl, making it a 10-stage pump; we wanted to operate against somewhat higher pressure—the discharge column, I should have said back there— [708] the discharge column, including the combination coupling, the tube joint and the shaft were all new, had evidently, from their appearance, never seen any service at all. bright, new castings, merely painted on the exterior. I watched this assembly. The tube line joint instead of being loose, comparatively loose, as in the first installation, was on the whole comparatively tight. I saw an occasional one that would sink almost to the shoulder, perhaps within an eighth of an inch of the shoulder, before it would support its own weight. White lead was also used upon the joints. A small amount of graphite grease was placed above each bearing, perhaps what I could put on the end of my finger; above that, after the tube was put into place, was

(Testimony of E. P. Lesley.)

placed a small quantity, I should guess a quarter of a pint of oil, poured into the top of the tube—heavy duty Zerolene, I was informed it was. In this pump we had, the bowls were all the same, they were the same bowls, except that an additional one had been added at the bottom, and in the top one a stuffing-box had been placed, at this point which is immediately above the runner. As I said before, a new runner shaft was supplied. The coupling of that runner shaft was special, in that it was longer than usual; ordinarily, the coupling is immediately above the bearings, perhaps within three-quarters of an inch; we placed the coupling up in the tube about one-half foot.

Q. Did the position of the coupling further up make any difference in the operation?

A. That could make no difference in the operation of the pump. The purpose of that was that we might screw the pump apart at this bowl, from the bowl at this point, and drop the whole runner shaft and get into that stuffing-box. [709]

Q. That could be done without disturbing the rest of the tubing?

A. Without disturbing the whole column assembly whatever, without moving it.

Q. Your purpose was, as I understand it, to test with and without the stuffing-box?

A. To test that installation—the purpose was to test the installation with and without a stuffing-box at that point. That pump was started in operation thus assembled—I had watched the installation of that packing myself; it was four turns, four rings,

(Testimony of E. P. Lesley.)

of, I think it was,  $\frac{3}{8}$ ths squares of packing put in, and then another ring put in on top of that; the joints were broken; a small amount of graphite grease was smeared along each piece of packing as it was put in. This pump was started in operation at 3:40 in the afternoon—we got the installation finished and started running; under a condition of free pump discharge, I noted that for 40 seconds there was practically a continuous discharge of graphite grease and oil from the drain tube; it ran right out, the graphite grease in rather a thick stream, running down by the bowl; in five minutes—the pump was started at 3:40, and at 3:45 I noticed the first drops of water, what appeared to be practically water. At 3:49 water slightly milky in appearance, very slightly, however; at 4:10 I collected a sample in bottle No. 4. The time of collection of that sample was possibly—I don't know how long it took that amount to run out; I made no note at the time; it was some time, as near as I could estimate, perhaps five or ten minutes, or possibly longer, ten minutes. I increased the discharge pressure at that time. That sample was collected with a free discharge. I increased the discharge pressure to 20 pounds per square inch at the pump head, and noted that apparently there was a little more rapid [710] discharge of about the same consistency. I collected no sample. During all of this time, the emulsifying oil, as represented by this bottle, had been fed at the top at the rate of, I have it, 12 drops per minute. That was on January 14, as I have the memorandum. On January 15 I started the same pump in operation

(Testimony of E. P. Lesley.)

again, left it running some time; it ran from 10 A. M. to 2 P. M., under a condition of shut-off head; it was then shut down. Then I started it again. I made no observation of the drain tube leakage in that time. I started again at 3:20 and went down to the bottom of the pit and observed a similar drain tube discharge, occasionally a globule of grease coming from within, a few drops or a little spurt of water, apparently carrying something with it, since it was discolored different from the ordinary water of the well. At 4:10—between the time of 4:10 and 4:25 I collected the sample in bottle No. 5. That conveys to me a very considerably greater proportion of emulsified oil than is contained in bottle No. 4. This would be natural. The pump had been in operation hours and the oil would have time to work down through. This sample was collected after the pump had been in operation, I think, 30 minutes only, and no oil had been put in the pump assembly; it was a new assembly.

Q. Did you still have the stuffing-box on top of the pump bowl?

A. The stuffing-box was there as before.

Q. Where was the water coming from that formed this emulsion?

Mr. LYON.—We object to that on the ground it is incompetent, no foundation laid.

Mr. TOWNSEND.—If you know, having seen it, where it came from.

A. I have an opinion where it came from.

Mr. LYON.—We object to the opinion. It is a mere guess. [711]



(Testimony of E. P. Lesley.)

The COURT.—He may answer.

Mr. LYON.—Exception.

A. In my opinion the water was coming from leaking tube line joint. I base that opinion on the fact that I had watched the installation of the packing. I am competent, I think, to determine approximately the amount of packing necessary to make a joint tight; under the conditions I believe that the joint at this point was tight around the shaft, that water could not enter there. That was the only place it could enter, other than the top of the tube line.

Mr. WHITE.—Q. Did you make a test to find out whether the water came through the packing?

A. No.

Q. You just surmised the water did not come through the packing, but came from the other source: Is that the idea?

A. That is not the idea. I think I am qualified to tell, as I explained about the pressure put upon the packing, as to whether it would make it tight under the circumstances. There was a further incident, I looked at the packing when it was removed, and it gave no evidence of having water passed through it. It was tightly compressed around the shaft. There were a number of other tests. At this time the question arose as to whether we were getting actually all the leakage that there might be through the tube line; that is, a question was asked if I was confident that there was no seal of the bearing by grease or oil that would prevent the water that might have entered from passing down

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(Testimony of E. P. Lesley.)

through, and I made a test to determine if the tube line were free. I poured in water at the top, that is, I poured it into the oil pipe line, which could be said with fair rapidity, much faster than we were feeding the emulsified oil. In some few minutes, the time does not [712] appear clearly, as I remember it it was a very short time, there was a more rapid discharge of liquid from the drain tube. That discharge—I have a very much larger sample—is in bottle No. 6. It is of the same general appearance as that in bottle No. 5. At the end of these tests I have described, the pump was taken out, or, rather, the pump was unscrewed at this bowl and the stuffing-box was taken out; we then inserted a bushing. This was done without disassembling the pump column, or without taking the shaft apart, the bushing having been previously made, a split bushing that accurately fitted the threaded portion where the gland had previously screwed in. I then made determinations of the rate of drain tube discharge, and what it was. This bottle No. 7 was collected as drain tube discharge under a condition of shut-off head. The rate was 1 gallon in two minutes and five seconds, a very considerably slower rate that had been previously encountered in the previous installation, using the same pump bowl and the same bearings upon the shaft; the only difference in fact being the difference in discharge column. This shut-off head at that time was with the 10-stage installation was 26 pounds per square inch at the top of the pump, plus the 79 feet of pump column.

(Testimony of E. P. Lesley.)

Mr. TOWNSEND.—Q. Just a minute; when you speak of a shut-off head of 26 pounds, could you translate that into elevation of water above the head of the pump?

A. Twenty-six pounds would mean, roughly, 60 feet. The figure is 2.31 feet per pound of head. I am rather slow at mental arithmetic; roughly 60 feet, I should say.

Q. One pound pressure means a pressure of 2.31 feet?

A. 2.31 feet. I noted that with free pump discharge, no pressure whatever at the top, merely the pressure of the 79 feet, the rate of [713] the drain pipe discharge was somewhat less; it was one gallon in 3 minutes and 20 seconds, less than had been encountered in the case of bottle No. 7; that is in bottle No. 8. It is a slower drain-pipe discharge than this taken previously, one within three or four minutes of the other. That concludes those tests. In order to have a certain demonstration that the tube line in an ordinary installation, a new installation, was after a short time of operation entirely free from obstruction, so that anything taken into the top would find its way out at the bottom, I made certain further tests on February 9, with the same pump that has been standing there for some time. We started the pump, and I observed the rate of the drain tube discharge, feeding Emulso oil as before, free pump discharge, 1 gallon in 2 minutes and 40 seconds, which is the sample in bottle No. 9. After I had collected that sample I went to the top and fed through a solution of red-

(Testimony of E. P. Lesley.)

dish color, of analine dye—fed that into an auxiliary pipe that I fitted opposite the oil pipe, and in 30 minutes from the time I started feeding this drop by drop, practically so, at a slow rate, the sample in bottle No. 10 appeared by the drain tube. This showed conclusively to my mind that there was entire freedom from any substantial obstruction to the passage of any lubricant down that tube line. I should say with respect to this sample in bottle No. 10 that this specimen, since I collected it, has been in my office a long time, partly exposed to sunlight, and it is very much faded from what it was at the time I got it. At the time I got it the visual demonstration was striking; there was this colored liquid of that sort as we observed it running out of the drain tube at the bottom of the pit, 80 feet, slightly milky in appearance, [714] and then suddenly an almost bluish red liquid running out. The sample as shown in bottle No. 10 has faded since I got it. That is natural with analine dyes. That concludes as much as I can say of the tests upon the pumps.

Mr. LYON.—On the grounds of the objection, your Honor, we move to strike the answer from the record and exclude it from consideration.

Mr. TOWNSEND.—We will carry this matter further, your Honor, to show you other conditions in connection with it.

The COURT.—I will let it stand for the present.

Mr. LYON.—Exception.

The COURT.—Without prejudice to renewing the motion later on.

(Testimony of E. P. Lesley.)

Mr. TOWNSEND.—In whose possession have these bottles been?

A. They have been in my possession since I got them, since I collected them.

Mr. TOWNSEND.—I ask that they be introduced in evidence as Defendants' Exhibits "Y-1," "Y-1a," "Y-2," etc., up to "Y-10," to be considered in connection with the explanation given by the witness.

Mr. LYON.—They are objected to on the same grounds as urged and exception noted.

Mr. TOWNSEND.—Will you state what conclusions you draw from the results of those tests?

Mr. LYON.—That is objected to as incompetent, irrelevant and immaterial, and no foundation laid.

The COURT.—Sustained.

Mr. TOWNSEND.—I will ask, then, what do these tests show?

Mr. LYON.—The same objection.

The COURT.—The same ruling. In order that you may understand the reason for the ruling, perhaps I should state to you [715] that the inference which I assume that you are asking for should be drawn by the judge or the jury; it is not an expert opinion you are asking for; it is a mere inference from such facts.

Mr. TOWNSEND.—It seems to me that he could express, as one skilled in the art, just what they demonstrated.

The COURT.—He has done that in this particular instance; that is, he has expressed the opinion that the oil passage or lubricant passage was kept open

(Testimony of E. P. Lesley.)

in this particular pump during the time it was experimented with, and he has also expressed the opinion that at least some, not all of the water, which was being discharged from these pumps at the lower end of the pump came in through leaking tube line joints. What else is it you want?

Mr. TOWNSEND.—It would be in the nature of a brief summary or deduction as showing the results obtained from that construction. I think, though, that the evidence, itself, points to the necessary inference, and I will pass on in view of the ruling, to other matters, reserving an exception to your Honor's ruling.

Q. Can you state what the effect of the rapidly rotating shaft would be upon the joints between the telescoping tube sections and hub sections?

Mr. WHITE.—That is objected to as no foundation has been laid.

The COURT.—He may answer "Yes" or "No."

Mr. TOWNSEND.—Q. Do you know what the result would be? A. Yes.

Q. Will you please state what the result would be?

Mr. WHITE.—I make the same objection.

The COURT.—If you desire to, you may ask him as to his competency. He has stated that he knows. I think that makes [716] a *prima facie* case of his competency.

Mr. WHITE.—Q. Did you ever make any tests in that respect?

A. Upon the effect of a rapidly rotating shaft?

Q. Yes.

(Testimony of E. P. Lesley.)

A. I have made many observations of the action of a rapidly rotating shaft.

Q. In regard to one of these pumps sold by the defendant corporation?

A. No. I have made observations upon their pumps.

Mr. LYON.—We renew the objection.

A. The effect of a rapidly rotating shaft?

Mr. TOWNSEND.—Yes.

Mr. LYON.—We make the objection on the ground there is no foundation laid.

Mr. WHITE.—We can all imagine what the effect would be of something rotating, that it may shake something, but I do not think he is qualified to answer that question.

Mr. TOWNSEND.—Q. Do you know what the result would be on this shaft if the rotating shaft did shake something, as counsel says?

Mr. LYON.—The same objection.

The COURT.—He may answer if he knows.

A. Yes, I know.

Mr. TOWNSEND.—Q. Will you please state what that result would be?

Mr. LYON.—The same objection.

The COURT.—He may answer. The objection is overruled.

Mr. LYON.—Exception.

A. The effect of a rapidly rotating shaft, provided the bearings are sufficiently spaced, is to produce vibration. Very few shafts are accurately balanced. The effect of vibration upon any shaft would be to keep it loose. [717]

(Testimony of E. P. Lesley.)

Mr. TOWNSEND.—Q. And, it being loose, what would be the result as to the passage or keeping out of water?

Mr. WHITE.—Objected to as immaterial. If this defendant sells a structure, having a shaft-enclosing casing that is tight, it is an infringing structure.

Mr. TOWNSEND.—That goes to the very point in issue. We want to show conclusively that the water passes through there. I don't know how we are going to prove it passes through there unless we get a man to testify to it who knows about mechanics in that respect. This goes right to the point that your Honor was talking about.

Mr. LYON.—The question does not go to the mechanical structure. It goes to theory. If this witness is testifying as to measurements, counsel's observation would be correct.

The COURT.—Have you ever made any experiments, or any observation as to the effect upon a structure of this sort, where the joints are constructed in the manner shown here, put together with white lead?

A. Have I made experiments with them?

Q. Yes.

A. Only these experiments that I have described.

Mr. TOWNSEND.—Q. You have described these as tapered hubs and slip joints on the tube section, have you not?

A. I don't remember that I used the word "taper" at all. I said that I noted that in the second installation of a new discharge column the



(Testimony of E. P. Lesley.)

tube line joints for the most part were borne in weight by the fit upon the hub before they reached the square shoulder that is provided for them. I said something of them, as I remember my words, they descended to within an eighth of an inch; I can't remember of any that went clear down without hanging up. I am certain that I watched every [718] one that was put on. I don't know, of course, what happens on the upper one; you cannot see it, of course, when it is put together.

Q. I believe you observed also that white lead was interposed at all the joints?

A. I said that the white lead was applied to the hub, smeared on by the installer's finger.

Q. Now, coming back to the question, what would be the result as to the passage or keeping out of water in a structure of that sort, in the presence of a rapidly rotating shaft—could the water pass by, or would water leak past, or would water leakage be kept out or could it be kept out?

Mr. LYON.—That is objected to as immaterial, irrelevant and incompetent, no foundation laid, the witness not having qualified to answer the question, and purely speculative.

The COURT.—I think I will let the witness answer if he is willing to answer.

A. The question of rapid rotation has nothing to do with it. The sole question is one of vibration. Vibration with parts weighing what these parts do would necessarily in time jar, wear them loose, which is unavoidable, and that would in time permit greater freedom, or would allow water to enter with

(Testimony of E. P. Lesley.)

greater freedom. That is obvious.

Mr. TOWNSEND.—Q. Have you observed whether there was any vibration of the columns that you were testing out?

A. Yes, there was not only vibration in these two instances, but there was what may be termed gyrations; of course, the whole assembly is hung from the top of the well, and the whole column gyrates in those two instances, very slowly; not at the rate of rotation of the pump shaft, but a slight gyratory movement, weaving of it; that was very apparent; [719] you could see it moving, weaving around.

Q. Is that condition of gyration and vibration one that would be peculiar to those two instances that you speak of, or would that be a condition prevalent in installations in general?

Mr. LYON.—That is objected to as leading, and incompetent, no foundation laid, the witness not having qualified to answer the question.

The COURT.—Overruled.

Mr. LYON.—Note an exception.

A. I think I can answer the question. I could observe nothing in that installation that would lead me to suppose that there were conditions there that would lead to this gyratory action or vibration, nor could I think of just what conditions would apply there. We have been operating a Western Well Works pump for some time at Stanford University. It is apparently rather free from vibration. There is a slight tremor to the whole apparatus.

Mr. TOWNSEND.—Q. What would be the effect of that tremor, would you say, on the joints?

(Testimony of E. P. Lesley.)

A. I don't think there is enough—I do not believe in the Stanford University installation there is enough to have any appreciable effect,—enough that I could observe. You understand that pump is installed in a bored well. I can only observe what is outside of the well above the ground.

Q. What would you say as to the operation of that pump, as far as you have been able to observe it, in comparison with the operation of the pump that you have testified about?

A. The two installations are somewhat different; one is a direct connecting unit, the other is a belted unit; that one factor, of course, may contribute toward vibration, and even gyration, and as it comes to my mind, it seemed that the probable [720] cause of the gyration, not of the vibration, but of the weaving in the Conant installation, it was a belted unit.

The COURT.—What do you mean by belted unit?

A. I mean that the shaft was driven by a belt, your Honor, from an electric motor; the belt had a lacing; the lacing, every time it goes through the pulley, slaps it, gives it a little pound; thus the lacing occurs apparently at long intervals as compared with the rate of rotation of the pump.

Mr. TOWNSEND.—Q. Did you observe the installation of the Western Well Works at Stanford University? A. Yes.

Q. How did that compare with the installation that you tested on the Conant ranch?

Mr. WHITE.—That is objected to on the ground that no foundation has been laid, it not being shown

(Testimony of E. P. Lesley.)

that he ever removed that Stanford pump.

Mr. TOWNSEND.—He saw it put in. I want to show how it compared with the one that was tested.

The COURT.—Overruled.

Mr. WHITE.—Exception.

A. How the installation compared?

Mr. TOWNSEND.—Yes.

A. The installation was practically the same, the pump column—of course, the head was different, because it is a direct connected motor—except for this, in that installation grease in addition to Arctic cup—I don't mean in addition to the Arctic cup grease, but grease in addition to the graphite grease was put around the shaft for a distance above the bearings.

Mr. TOWNSEND.—Q. How did the bearings and shaft tubing and the hubs compare in that installation with those that you saw installed in the Conant structure? [721]

Mr. LYON.—Just a question: Did you measure any of them?

A. Measure any of the bearings?

Q. In the two installations, or did you just compare them with your eye?

A. I did not compare them even with my eye.

Mr. LYON.—We object to the question as incompetent.

The COURT.—Sustained.

Mr. TOWNSEND.—Q. What was the basis for your statement that you observed the Stanford University installation?

(Testimony of E. P. Lesley.)

A. What was the basis for my statement?

Q. Yes, and that you know what went in there.

A. I stood upon the ground and looked at it.

Q. Did you see the tube sections as they were put in?     A. Yes.

Q. Did you see the combination coupling at the hub section?     A. Yes.

Q. How did these hub sections fit in to the tube sections?

A. I had no particular interest in observing them; I did not pay any attention to them.

Q. Have you observed any other installations of the Western Well Works, so that you would be able to compare it with the Conant installation and demonstration?     A. Not that I remember.

Q. Do you use the same method of lubrication on the Stanford pump, or a different one, than you used in the Conant demonstration?

A. We use the same method of lubrication, or feed this oil, that is supplied by the Western Well Works.

Mr. WHITE.—I thought you said in the Stanford installation you put in some Arctic cup grease and you did not use it in the Conant?

A. That is quite true; in the installation we put in—I say we put in—I observed that there was put in—I did not have my hands in it—grease; I don't know whether [722] it was Arctic cup grease or not, but it was a white grease or yellowish grease, different from graphite grease. In the Conant installation we used graphite grease and a small quantity of Zeroline oil alone over each bearing;

(Testimony of E. P. Lesley.)

we put in no other grease at all.

Q. But at the Stanford installation they used graphite, then cup grease, and then the lubricating oil. Is that correct?

A. I believe lubricating oil was poured in there, but I don't know how much of it. I did not pay any particular attention to it. It was apparently a standard installation. This Stanford installation was in April or May of this year.

Q. You say that was a standard installation. Is that correct?

A. Apparently a standard installation. I did not notice any particular difference; it was in April or May of this year, after I had finished with all of the tests that I was interested in conducting.

Mr. TOWNSEND.—In your opinion, is it possible to test one of these pumps outside the ground without operating the pump?

Mr. LYON.—We object to that as immaterial, irrelevant and incompetent.

The COURT.—Sustained. We will take an adjournment now until to-morrow.

(An adjournment was here taken until to-morrow, Wednesday, September 8, 1920, at 10 o'clock A. M.)  
[723]

In the Southern Division of the United States District Court for the Northern District of California, Second Division.

Before Hon. FRANK S. DIETRICH, Judge.

No. 485—IN EQUITY.

LAYNE & BOWLER CORPORATION,

Plaintiff,

vs.

WESTERN WELL WORKS, INC., et al.,

Defendants.

**Proceedings Had September 8, 1920.**

Wednesday, September 8, 1920.

**Reporter's Transcript.**

In the Southern Division of the United States District Court, in and for the Northern District of California, Second Division.

Before Hon. FRANK S. DIETRICH, Judge.

No. 485—IN EQUITY.

LAYNE & BOWLER CORPORATION,

Plaintiff,

vs.

WESTERN WELL WORKS, INC. (a Corporation), ROTARY DRILLING & DEVELOPMENT COMPANY (a Corporation), STANLEY H. HALSTEAD, P. E. VAUGHAN, and ALLEN W. ROSS,

Defendants.

Wednesday, September 8, 1920.

Counsel Appearing:

For the Plaintiff: FREDERICK S. LYON, Esq.,  
and WILLIAM K. WHITE, Esq.

For the Defendants: CHARLES E. TOWNSEND,  
Esq., and W. A. LOFTUS, Esq.

**Testimony of E. P. Lesley, for Defendants  
(Resumed).**

E. P. LESLEY, direct examination (resumed).

Mr. TOWNSEND.—Q. Professor Lesley, you described the method of lubrication that you observed in the tests in the Conant pump, and the method of lubrication as it would occur in the pump of the Defendant's Model V, and you have had opportunity, I believe, to observe the structure in the Anderson pump, Plaintiff's Exhibit "4."

A. Yes, sir.

Q. I will ask you what difference, if any, is there in the principle of lubrication in the operation of a pump of defendant's [725] manufacture, where the tube line is tight so that no water can enter the tube line at the tube joints, and a pump where water may enter into the tube line at the tube joints, using, of course, in each instance, the drain pipes at the bottom? A. None whatever.

Mr. LYON.—Just a moment. We object to the question as leading, as grossly leading, and it is incompetent, the witness not having qualified to answer the question. And I move that the answer be stricken from the record until there is a ruling.

The COURT.—The objection is overruled.



(Testimony of E. P. Lesley.)

Mr. LYON.—Exception.

Mr. TOWNSEND.—That is all.

Cross-examination.

Mr. WHITE.—Q. Where were those tests made of the two pump constructions on this ranch?

A. On the farm belonging to Mr. E. W. Conant.

Q. Is he the father of the chief engineer of the defendant?

A. He is the father of Mr. David Conant; yes.

Q. The man who has heretofore testified?

A. He is the father of the witness who testified here recently.

**Testimony of David Conant, for Defendants  
(Recalled).**

DAVID CONANT, recalled for the defendants.

Mr. TOWNSEND.—We promised the Court we would gage the hub ends of the exhibit to see whether or not it conformed to the standard. I want to state that this whole matter is largely an immaterial issue, as to the tightness of the joints. I will assist in every way to expedite the trial, in showing that the tightness or the looseness is an immaterial matter.

Q. Mr. Conant, have you the gages that were referred to yesterday [726] by which you make tests from time to time as to the standardization of your product?

A. I have the gage of the hub ends of a 2½ inch tube.

Q. Will you now gage this exhibit which has been

(Testimony of David Conant.)

marked "Defendant's Exhibit 'C' for Identification"? I will ask you, first, is that your standard gage? A. Yes, sir.

Q. Is that the gage that is employed in your regular shop practice? A. Yes, sir.

Mr. WHITE.—I would like to ask him a question or two.

Mr. TOWNSEND.—Very well.

Mr. WHITE.—Q. When you were on the witness-stand, you stated that you did not know that the hub construction of the defendant had been changed from a hub having straight sides up to within  $\frac{3}{4}$  of an inch of the seat, and then a taper from there on, and a hub construction having a taper from the end of the hub to the seat; is that correct?

The COURT.—Yes, he so stated.

Mr. WHITE.—Q. What kind of a gage is it that you have? Does that have a taper  $\frac{3}{4}$  of an inch in width, or does it show a taper from one end to the other of the gage?

A. This gage is to measure the outside diameter of the hub at a certain point on the hub.

Q. Does that gage have an interior taper edge to edge?

A. No, sir; the gage does not serve that purpose.

Mr. LYON.—Then, if your Honor please, we object on the ground that the attempted demonstration or measurement would be eternely futile if the gage does not correspond to the hub in any manner.

The COURT.—He may make the measurement if you desire him to do so.

(Testimony of David Conant.)

Mr. TOWNSEND.—It is immaterial, from our point of view, [727] your Honor.

The COURT.—It would not show whether this tapers from the outer edge to the seat, or not, if that is the nature of the gage, but he may make the measurement if you desire him to do so.

Mr. TOWNSEND.—It is immaterial where the taper occurs, or the extent of it.

The COURT.—That is a matter of argument. You may proceed, and make your test or measurement.

Mr. TOWNSEND.—Q. Please state what your measurements have shown to you.

A. The gage does not do down as far as it should, according to our specifications.

The COURT.—How near to the seat does it go?

A. It goes within 9/16ths of an inch to the seat; our requirements are  $\frac{3}{8}$ ths of an inch; 3/16ths of an inch too long a taper.

Mr. TOWNSEND.—Q. State whether or not that hub, as it stands there, would be a commercial hub used in your pumps.

Mr. LYON.—We object to that as leading and suggestive. They have produced it here for that purpose, and we have proved measurements of other hubs corresponding identically with this.

The COURT.—The objection is sustained.

Mr. TOWNSEND.—Q. Were you present at the time the Nielsen pump was put on your place for the demonstration which Mr. Lesley has testified to?

A. Yes, sir.

(Testimony of David Conant.)

Q. State how that installation compared with the standard practice of installation of Western Well Works pumps?

Mr. LYON.—We object to that as immaterial, irrelevant and incompetent.

The COURT.—The objection is sustained.

Mr. TOWNSEND.—That is all. [728]

The COURT.—What is standard practice is open to a great deal of question. You may ask him what was done, and then you may perhaps ask him what is ordinarily done, if he knows. I don't know that he does know.

Mr. TOWNSEND.—Q. Do you know what is done in installing Western Well Works pumps, in assembling them?

The COURT.—You may answer that "Yes" or "No." A. Yes, sir.

Mr. TOWNSEND.—Q. Do you know what was done in assembling the Nielsen pump for the purpose of this test? A. Yes, sir.

Q. Will you state what was done?

A. After the derrick had been set over the pit, the pump unloaded from the truck and placed alongside the pit, the suction pipe was lowered into the well and hung on a clamp; a set of bowls was then attached to it; that was lowered down until the top bowl was even with the top of the pit; and that held in a clamp. The first section of discharge column, with its tube and shaft attached by means of a rope sling, was raised and hung over the pump as now in the well; the shaft was lowered down and screwed

(Testimony of David Conant.)

on to the collar on the top of the runner shaft. The hub was covered with white lead, the tube slipped into position, the discharge column, with its combination coupling on top, lower down, rotated first by hand, and then tightened up with chain tongs. The assemblage was then hung from the derrick, lowered down until this combination coupling resting on the clamp was at the top of the pit. The remaining sections of the discharge column were then attached as this first one.

Q. Referring to Defendants' Exhibit "C" for identification, do you ever make tests for size, such as you made here now?     A. Yes, sir.

Q. State whether or not this hub would pass inspection? [729]

Mr. LYON.—We object to that as irrelevant, incompetent and immaterial, and an attempt to impeach the stipulation of yesterday. We stipulated yesterday, may it please your Honor, that that was one of their standard hubs. After we had measured it, counsel asserted it and we stipulated it in the record.

Mr. WHITE.—And the reason we stipulated it, if your Honor please, was because we knew what the standard hubs were, from our measurements made on last Monday in the field.

Mr. TOWNSEND.—If your Honor please, that particular hub was simply offered at the time it was offered for the purpose of showing the spiral groove, and the method of construction. I don't care whether it goes in, or not. It seems to me it shows

(Testimony of David Conant.)

a part of the defendant's product. The spiral grooves are there. We offered it solely for that purpose at the time. I confess that we waste a great deal of time over immaterial measurements. We do not care whether those things go down and freeze there or whether they fit in with a wedge fit, or not.

The COURT.—Then why take the time to go into it?

Mr. TOWNSEND.—I am willing to pass it.

Mr. LYON.—Are you willing to stipulate it is passed down with a wedge fit so that there is a tight joint at the end of the enclosing shaft casing?

Mr. TOWNSEND.—If it will help you any, yes. Sometimes they are more or less tight. Sometimes they are very tight and exclude water, and sometimes they are not and do not exclude water. It goes back to our system of lubrication, which is a circulatory system, and—

The COURT.—I don't want any argument now. Do you want this to go in, or not?

Mr. TOWNSEND.—I want to identify it as a product of [730] the defendant, in which we have the spiral grooves. We have had it detached from any other exhibit, and we have it here. They can bring any free couplings in here they wish to, just so long as the Court has before it a free combination coupling. I think that for the purposes we brought it in here originally it has been completely proved to be the defendant's product.

(Testimony of David Conant.)

The COURT.—Well, do you want to press the question, or not?

Mr. TOWNSEND.—I offer it now as Defendants' Exhibit "C," inasmuch as we have been talking so much about it.

The COURT.—Very well.

Mr. TOWNSEND.—That is all.

Cross-examination.

Mr. WHITE.—Q. Have you produced a blueprint disclosing the details of construction and the measurement of the hubs on your coupling sections?

A. I believe I have it with me.

Q. This gage that you have produced here is merely a section having the same interior diameter of your tube section after it has been checked; Is that correct?

A. That is a gage made to fit the hub ends at a certain position. It is of such diameter that it will, when correctly machined.

Q. After one of the tube sections has been reamed, has it identically the same diameter of this gage?

A. A certain tube might have; there is a tolerance in the tube section which would not permit that statement to be made, possibly, as a general statement.

Q. Is it the object of your operation in the factory to ream out the interior of your tube end so that it will have the inside diameter of this gage?

A. No, sir, it is impossible with our method of manufacture.

(Testimony of David Conant.)

Q. You don't aim to ream out the end of the tube so that it [731] will have such diameter?

A. Within manufacturing tolerance, yes.

Q. You do?

A. Yes, within manufacturing tolerance.

Q. So that within practical manufacturing possibilities, the interior diameter of your tubes, after the ends have been reamed out, is the same as this gage: Is that correct?

A. I may make the statement here, if you are making watches, you can use a tolerance much smaller than the tolerance you can use if you are making pumps; so I will repeat what I have said before, yes, within manufacturing tolerance.

Q. The inside diameter of this gage is supposed to be the diameter of your tube end after it has been reamed out, is it?

A. It is the average size.

Q. It is? A. Yes.

Q. Why didn't you say that in the first place?

A. Because that is the answer I gave you to the question you last asked, and not to the first one.

Q. And the interior surface of this gage is not tapered in any way, it simply represents a pipe section: Is that correct? A. Certainly.

Q. Are you prepared to say that in the pump construction at the Selby ranch, where some of your pumps were sold to Mr. Sherrer, the coupling sections did not have hubs identical in dimensions and taper with this hub on this exhibit?

A. No, sir, because I didn't measure the particular hubs that entered that pump, so far as I



(Testimony of David Conant.)

know. That is not my business.

Q. This blue-print which you have produced is dated April 19, 1919: Is that correct?

A. Yes, sir.

Q. And that shows the details of construction of your hub when you taper it only for a width of  $\frac{3}{4}$  of an inch from the seat: [732] Is that correct?

A. Yes, sir.

Q. Have you produced a blue-print, or can you produce a blue-print showing the present construction of the hub?

A. That is the blue-print we are working on to-day. There has been no other blue-print in regard to that part of the pump made since then, that is, no other tracing made from it. Blue-prints have been made from it at different times when we required prints.

Q. Does the taper on this hub, Defenudaits' Exhibit "C," correspond with the taper illustrated here in this drawing, with respect to extending only  $\frac{3}{4}$  of an inch from the seat?

A. I have not checked it for that purpose. I have only checked it for the purpose of seeing that that gage would fit on this hub.

Q. I thought you checked it up yesterday?

A. No, I did not.

Mr. WHITE.—We offer this blue-print in evidence and ask that it be marked "Plaintiff's Exhibit 17, blue-print Defendants' Second Hub Construction."

Q. This blue-print does not show the details of construction of the exterior of the hub couplings as

(Testimony of David Conant.)

the same exist in the exhibit?

A. What are the variations. I can't see it from here.

Q. I will show it to you.

A. The difference between these two is a matter, on the exterior of the casting, which is not machined, a point which has been made in order to adapt that coupling to an automatic machine which we have recently installed.

Q. Have you a blue-print disclosing its exterior appearance?

A. There has been no blue-print made of that.

Q. Yesterday you stated, I believe, that this hub was machined at the same time the coupling was threaded, and, therefore, that the machining of the coupling didn't cost anything: Is that correct?

A. I did not state, as far as I can recall, that the machining of the hub did not cost anything. It was [733] made in the same operation as finishing the rest of the hub.

Q. When you say it was made in the same operation, you mean that the hub was made, was machined, and then the threading of the hub?

A. No.

Q. You mean that simultaneously the hub is machined and the hub is threaded? A. No, sir.

Q. Well, what do you mean then?

A. There are two or three operations to finish the end of one of these hubs. There are tools which make a certain cut on the hub and that same forming tool carries cutters which face out the portion that is threaded. The cutters which finish the hub

(Testimony of David Conant.)

are attached to the forming tool, which also has cutters to face the threaded portion and cut recesses. The facing operations are done on the same tool, whether it is the part that is threaded, or the hub.

Q. But not done at the same time?

A. You cannot thread and face at the same time with the tools we use.

Q. So that the machining of the hub is a matter of expense to your company, that is, the machining in such a way as to taper the hub?

A. It is in this respect, that when the tools are built the cost of the cutter is in addition to the cost of the cutter which faces the other piece at that time.

Q. About what is the cost of so machining this hub, and about what time is consumed in the machining operation?

A. The labor cost, as far as I could say, is nothing in addition to what we would have to pay for the machining of the coupling, itself.

Q. What is the cost, in your estimation, of machining the hub in that way?

A. I cannot give you an estimate on that.

Q. Does it not take more time to machine a hub in that way than it would if you did not have the machine at all?

A. I have just made the statement that the labor charge would not be more. [734]

The COURT.—I don't understand how that could be. Can you explain that? I understand they are consecutive operations.

(Testimony of David Conant.)

A. Yes, sir. You take a rough casting; it is clamped in a clutch; the tool which enters here has cutters on the outside which face that and cutters on the inside which face this. Before that is threaded it must be smoothed out, you don't thread on a rough casting. When this tool enters here, it is a casting with several cutters on it, it is a gang cutter, it cuts this and cuts that outside, preparatory to threading.

Q. Those two operations, then, are simultaneous?

A. Yes, but that is not the operation of threading; that is a separate operation. There is nothing done to the hub at the time that is threaded.

Mr. WHITE.—Q. Have you still got that blue-print you gave us yesterday showing the hub construction having the straight sides?

A. I have not.

Mr. WHITE.—Mr. Townsend, could you supply us *what* that blue-print? We would like to put it in evidence.

Mr. TOWNSEND.—I would if I had it here. That was an old one. I have not seen it since it was exhibited. It bore a date prior to 1916. I will be very glad to supply it if you want it.

Mr. WHITE.—Yes, I would like to have it. That is all.

#### Redirect Examination.

Mr. TOWNSEND.—Q. How long has the practice been followed, as shown in that blue-print, of tapering to  $\frac{3}{4}$  of an inch, if you know?

Mr. WHITE.—Objected to on the ground that the

(Testimony of P. E. Vaughan.)

witness has already disqualified himself from answering that question.

The COURT.—The objection is sustained.

Mr. TOWNSEND.—That is all. [735] .

**Testimony of P. E. Vaughan, for Defendants.**

P. E. VAUGHAN, called for the defendant, sworn.

Mr. TOWNSEND.—Q. Please state your occupation.

A. I am an executive officer of the Western Well Works.

Q. One of the defendants in this case?

A. One of the defendants in this case.

Q. Are you familiar with the defendant's construction? A. Yes, sir.

Q. Are you familiar with the methods of installation and operation? A. Yes, sir.

Q. Have you ever installed any Western Well Works pumps?

A. At numerous times.

Q. Have you ever had occasion to remove any Western Well Works pumps?

A. In many instances.

Q. Are you familiar with the method of lubrication employed in the Western Well Works construction? A. Yes, I am.

Q. Will you please state what effect, if any, the tightness of joints in the Western Well Works tubing has?

Mr. LYON.—That is objected to as incompetent, and no foundation laid, the witness has not shown

(Testimony of P. E. Vaughan.)

himself to be qualified to answer the question.

The COURT.—I do not believe I quite understand the question. Will you read it, Mr. Reporter? (Question read by the reporter.) The objection is sustained.

Mr. TOWNSEND.—Q. I should have made it clearer. I mean what effect has it on the lubrication; what effect on the tightness of the joints of the Western Well Works pump has the lubrication of the pump?

Mr. LYON.—The same objection.

The COURT.—Do you mean the tightness or the openness of [736] the joints?

Mr. TOWNSEND.—The tightness or looseness of the joints on the hubs, what effect that has upon lubrication.

Mr. WHITE.—We object on the ground that it has not been shown that he knows what kind of a joint is in that construction.

Mr. TOWNSEND.—Oh, well, I am shortening it up. He is one of the manufacturers.

The COURT.—I think you may ask him a question that would perhaps be partly hypothetical, assuming that the joints are open, or assuming that they are closed, what effect will that have.

Mr. WHITE.—We have no objection to that.

Mr. TOWNSEND.—Q. I will put it this way. Will you state what the difference in operation is, if you know, if there is any difference, in the lubrication system in the Western Well Works pumps, where the joints are open or loose, and where water can enter at those joints, or where the joints are

(Testimony of P. E. Vaughan.)

tight and no water can enter the joints?

Mr. LYON.—We object to that as incompetent, no foundation laid, the witness not having qualified himself to answer the question; also as immaterial and irrelevant.

Mr. TOWNSEND.—I did not think it was necessary to go all through the building of the pump.

The COURT.—He may answer. The objection is overruled.

A. The difference would be none. The effect would be slightly different, depending on the amount coming.

Q. The amount of water, do you mean?

A. The amount of water coming in at the joints; by our system of lubricating—

Mr. LYON.—We object, your Honor, the witness has answered the question. [737]

The COURT.—Yes. That would be going beyond the scope of the question.

Mr. TOWNSEND.—Q. It has been testified here that the defendant uses emulsifying oil; do you know of such use? A. We do.

Q. Are you able to state why emulsifying oil is used? A. I am.

Mr. WHITE.—One minute. That is objected to as immaterial, irrelevant and incompetent, and not calling for a fact that is relevant.

The COURT.—The objection is overruled.

Mr. TOWNSEND.—Q. Will you please state why you use emulsifying oil?

A. We use an emulsifying oil for the reason, first, that in its pure state it is a good lubricant,

(Testimony of P. E. Vaughan.)

and mixed with a sufficient quantity of water it is still a good lubricant. Second, by reason of the fact that after the pump is shut down, the water in our pump comes back on the inside of the column line, to the static head of the water in the well, and it forms a milky coating over the bearings and the shafting, and the inside of the tube, and prevents rust action. It is very essential that this be done wherever possible, for the reason that as soon as a piece of metal, or steel, or cast iron is exposed to water, especially in an inoperative form, it commences to oxidize, and immediately when starting up the pump the portion that is in the bearing will throw off the rust particles and cause them to cut and wear the shaft and bearing.

Q. I show you a blue-print which is marked "Plaintiff's Exhibit 2," of the open pit, unprotected-shaft-pump installation, and ask you if you have ever seen any installation of that character?

A. Many; a great many.

Q. Where have you seen such pumps, and how recently?

A. I have seen them the last few days in the Santa Clara Valley; in the [738] last five years I have seen them almost in every portion of the state.

Q. Have you seen them in operation?

A. Quite a good many of them.

Q. Were they pumping water?

A. Pumping water.

Q. Were they pumping successfully or unsuccessfully?



(Testimony of P. E. Vaughan.)

A. Apparently satisfactorily and successfully.

Q. Have you, in the Western Well Works, in the sale of your pumps, come into competition with this open pit, unprotected shaft construction?

Mr. LYON.—We object to that as leading and suggestive, and as calling for the conclusion of the witness.

Mr. TOWNSEND.—Q. State whether or not you do come in competition with them.

Mr. LYON.—The same objection.

The COURT.—The objection is overruled.

A. We have come in competition with them.

Mr. TOWNSEND.—Q. Do you know of any concern or concerns now manufacturing or featuring open pit, unencased-line-shaft pumps?

A. I know of a great many manufacturers that are offering them for public sale.

Q. Can you mention some?

A. The American Well Works, of Aurora, Illinois, have a catalog out on them, and have agents on the coast. I know several districts in which we come in active competition with their sales agent. The United Iron Works, across the bay, in Oakland. I have seen Byron Jackson installations within eighteen months—I presume they were made within that length of time; I don't know that they feature them, or advertise them very heavily, but I know of agents who have put in new Byron Jackson pumps within a year and a half. Our [739] Terra Bella agent comes in contact with competition from—

(Testimony of P. E. Vaughan.)

Mr. LYON.—We object to this, unless it is of his own knowledge, your Honor.

Mr. TOWNSEND.—Q. Speaking of your own personal experience and acquaintance with this construction, that is what we are asking for.

A. We come in contact with considerable competition with the pit pump, especially in the Santa Clara Valley, where I personally observed it, and noticed it, and saw it.

Q. You understand that my question and your answer are directed to construction such as shown in the blue-print, Plaintiff's Exhibit 2? A. Yes.

Q. Are you able to say whether your pump, represented by Defendants' Exhibit "V," would be a practical pump with the encased line tubing or shaft tubing removed—with the shaft tubing removed?

A. Yes, it would be a practical pump.

Q. Have you ever seen any deep well turbine pumps with the shaft concentric with the discharge pipe, and the shaft-bearings and shaft unprotected?

A. I have.

Q. Where, and when?

A. Several this spring, built by a competitor of ours locally—San Jose.

Mr. TOWNSEND.—That is all.

Cross-examination.

Mr. LYON.—Q. Did you personally have anything to do with the sale of pumps to a man by the name of Sherrer, at the Shelby ranch, near Palo Alto? A. I did not.

Q. Do you know of that sale?

(Testimony of P. E. Vaughan.)

A. I know it was made, yes.

Q. Do you know what kind a pump was displaced by the first one of your installations?

Mr. TOWNSEND.—That is objected to as immaterial, and not cross-examination.

The COURT.—The objection is overruled. [740]

A. I don't know what kind of a pump was replaced.

Q. Didn't you know that the contract was given you to replace a United Iron Works unprotected centrifugal pump that had gone bad because of the bearings being cut out by the sand within three hours of its installation?

A. I don't know this, but I will say this much, that there was talk around the office, and I think we did replace such pump.

Q. As you understood it, that was the reason why you got that installation, to replace a pump of the United Iron Works that had gone bad in three hours' time in the bearings because they were unprotected, was it not?

A. I heard very little discussion about it around the office, but I am confident that we did replace a pump built by some competitor; as to the reason why, we did not care, and I am not familiar with it.

Q. That was one of the competitors that was making the unprotected bearing pumps that you refer to here?

A. I think they do, and I think they still make it. Those pumps function perfectly in certain conditions.

Mr. LYON.—That is all.

(Testimony of P. E. Vaughan.)

Mr. TOWNSEND.—That closes the defendants' case, your Honor, with this suggestion I would like to make: I wish formally to move that the contract of October, 1914, which has been introduced in evidence by the plaintiff, I think as Exhibit 3, be excluded from consideration upon the ground that it is immaterial, and it having expired, and having no bearing whatever upon the case.

The COURT.—That question will be given consideration ultimately; I will not pass on that now.

Mr. LYON.—We wish to renew our motion to strike from the [741] record and exclude from consideration the testimony of Professor Lesley with regard to tests that he made with the pumps on the Conant ranch.

Mr. TOWNSEND.—I would like to have an opportunity to be heard on that, if your Honor feels disposed to decide adversely.

The COURT.—I am inclined very much to think that that is self-serving testimony, and is objectionable for that reason.

Mr. TOWNSEND.—That would be probably true of any tests, they may be self-serving, or they might be just the contrary. That test was made *bona fide*. These defendants have been sued; they have had no occasion to make a test to ascertain those things; they had a merchantable commodity which they were selling under their own patent, their own exclusive patent, with the right, under the patent, to exclude all others from that patented structure. Your Honor knows the presumption of law that

where such a condition as that arises the defendant is presumptively a noninfringer.

The COURT.—That is true. The difficulty about this particular test or experiment is as suggested by me originally, it would be very easy, of course, to make an installation of this kind that would leak, that is, to leave one or more joints in such condition that the water would percolate through and into the tubing. Apparently, the only purpose of the experiment, or the only result of it, is to show that water did get into this tube and come out through the discharge vent—

Mr. TOWNSEND.—May I interrupt to correct your Honor in that matter? That test was made to see whether the theory of operation, as is presumed to exist as to what takes place in the well, that the lubricant, or whatever is fed in at one point comes out at the bottom. When Professor Lesley applied [742] the analine dye test at the top and it came out at the bottom, it showed that that pump worked on a circulatory system. In a sense, it was not necessary for us, in view of the admissions that that is what happens in the Anderson pump, where the oil goes from bearing to bearing and out in the well. The tests by Professor Lesley conclusively demonstrated that because they were proof positive to the eye, aside from any other deductive information that may be drawn. It brings our pumps within the doctrine of the Getty case, and the decisions of the Circuit Court of Appeals of the Fifth Circuit, that a pump which employs a circulatory system of oiling does not infringe the stagnant system of

lubrication of the Layne patent. Those tests were proof positive of the circulatory system. The leakage is an incidental feature. If you have some leakage it produces the emulsified action. Where the leakage comes from is not so material. I am referring to this now, because I think it may tend to shorten the rebuttal. If it is intended to prove a tight joint, or a loose joint, I am willing to concede now that that Anderson test, if it shows it is a tight joint, that it is a tight joint. But whether those joints are tight or sealed cuts no figure, so long as there is the communication of the lubricant through the tube line and out into the well.

I want to make our position perfectly plain, and show that we lay all our cards right on the table here, and we are not depending on any fine points as to a loose fit, whether it keeps out water or keeps in water. We did feel that by the demonstration we would have an opportunity to observe all the conditions, favorable or unfavorable to us, and to see the conditions as they actually existed. There may have been some leakage, or there may [743] not have been leakage. Water came from somewhere. I think that those tests are highly instructive. There *bona fideness* will not be questioned, I think, even by the plaintiff, because we are not here to trifle about these matters. This is a serious matter affecting the entire industry, and the business of my client.

The COURT.—That is true, but tests might have been made of regular installations. As I have suggested, the difficulty about this is not that the Court is going to find there was any bad faith in a partic-

ular experiment, especially on the part of Professor Lesley, but the question, however, is as to whether or not the installation here was made precisely as installations ordinarily made. It appears to the Court that it would be very easy to affect the operation of this pump as respects to which you refer by slight changes in the actual installation. It may or may not be that there would be this circulatory system rather than that the system would act as a circulating system of lubrication if no water entered the tubing. Possibly the water has something to do with making efficient the circulation of the oil.

There is this further suggestion in connection with this particular installation as it appears from the testimony of Professor Lesley, that when it came to installing the pump at Stanford University, there was apparently introduced into the tubing the usual amount of hard grease, or heavy oil—that which was somewhat immobile, at least, whereas, for some reason, that was omitted from the particular installation at which the test was made. It does not appear why. It may or may not be that that has something to do with the entry of water into the tube, or the circulation of water, or the circulation of the oil. [744]

Mr. TOWNSEND.—I was under the impression that the use of that oil or grease, or whatever was put in, was made clear in a new installation, that is, on account of the rough surface that is left in a turned bearing.

The COURT.—It is not made clear to me why so much is put in at a distance from the bearing.

Mr. TOWNSEND.—I think if that doubt exists

in your mind I would ask leave to have it cleared up. We want to know everything about this matter of lubrication, and how it is done, and why it is done, to see whether or not that interferes with the circulation. I do not believe your Honor has the impression that the tube line is filled with hard grease, or filled with any other particular kind of grease. I am sure your Honor has not that impression.

The COURT.—No, it is not filled. As I understood it from one of the witnesses, the installation takes place in about this manner, that when they are ready to assemble the pipe, as much grease is put upon the shaft for a certain distance, perhaps one-third of the length of each section, as can be introduced into the enclosing tube. In other words, for a distance of two or three feet upon each section of the shaft there is enough grease to entirely fill the tube.

Mr. TOWNSEND.—I think your Honor is in error about there being enough grease to fill the tube. From all my inquiries that is not the case. They put in enough there so that that is going to work down and smooth the bearing, and then it is expelled very quickly after the pump starts. If you desire some evidence on that point, I would like to make that perfectly clear.

The COURT.—I think you went into that. You asked him [745] if grease was put in there, and why, and to what extent, etc. There is not very much difference between the witnesses on that, that is, I mean the testimony given by your witnesses



and the testimony produced by the plaintiff in the case.

Mr. TOWNSEND.—The grease is put in there to wear down the bearings. What Professor Lesley said was this: In starting the new pump there, where the grease was put in, that grease or heavy unemulsified lubricant was very quickly dispelled out of the drain tubes. We have had the evidence of Mr. Bradford, who had occasion to pull these pumps, where he saw the heavy grease on the outside of the pump casing adjacent to the drain tubes. That had come from the inside. We have had evidence, I think, showing the operation of expulsion. The spiral groove acts to bring that about. Now, as I say, if there is any question on that point as to what becomes of that grease, hard grease or otherwise, I would like to have it perfectly clear now, rather than be surprised later.

Mr. WHITE.—Your chief engineer covered that point, as to what becomes of it.

Mr. TOWNSEND.—If counsel concedes that the hard grease is put in there for the purpose of wearing down the bearings, and is eventually expelled, that will be sufficient.

Mr. LYON.—According to our evidence and according to our contention, it is not put in there for any such purpose at all. It stays there, as the evidence of your witness shows; it has been found there from two to three years after the installation has been had, after the pump has been in use. Your witness testified to that yesterday.

Mr. TOWNSEND.—There is no doubting the evidence that has been given, or of the fact that some of

that heavy grease [746] is splashed around there, and some of it is going to stay in the tube and some of it on the shaft. If your Honor desires to be further enlightened as to why particular grease is put in, and what becomes of it, I do pray the opportunity now that that evidence be adduced on our behalf.

Mr. WHITE.—I think you covered it fully.

The COURT.—Yes, I understood that to be an issue. The plaintiff introduced some evidence upon it; your witness, who formerly installed pumps for you, testified as to that. I don't recall his name. You have elicited testimony from at least two witnesses on that point, as to why it was put in there, and some testimony as to what becomes of it, in whole or in part. I have referred to that, not for the purpose of having a discussion of the merits, or a discussion of that particular feature upon the merits, but as indicating the thought that was in my mind as to how easy it would be to differentiate between a regular installation and an installation of this kind, which was to be observed for the purpose of having the observers testify to the court.

Mr. LOFTUS.—There is one point there, your Honor, that may not have been brought out clearly, but a part of this defendant's pump was removed from the Nielson ranch; it was an old structure, in part, which would probably require a little different installation from an entirely new pump, in the matter of applying grease to work in the bearings. I do not know if Mr. Nielson's testimony is connected up.

The COURT.—I think I will take that under consideration, gentlemen. My present impression, however, is quite strongly against the competency of this testimony. I had thought, when you offered it, it would be connected up more closely than it [747] has been. I may say to you that if I regard it as competent at all, I will be able to give it very little weight. That does not imply that I give Professor Lesley's testimony very little weight; assuming to be true all that he has stated, the question is as to whether or not the installation there was precisely such installation as you make in actual practice. It does not answer that question to say that in a general way the installation was the same; it is a question of detail, because, very clearly, this whole matter of the circulation of oil and of the action of water in the shaft tube, depends upon detail. General installation, or the general process of installing, may be practically the same in two installations, and yet the operation may be entirely different touching these two different features.

Mr. TOWNSEND.—I would like to emphasize one feature further, so that it may be clear in your mind. When you come to consider the other cases, particularly the Getty case, where noninfringement was held, where there was a circulating system, the casings and the tubings were apparently tight. There were tight tubings. That is an artificial issue which the plaintiff has interjected here. We have an additional—different and additional function in our construction, and that is why I say it is immaterial.

The COURT.—If it is, do you desire to stipulate

(Testimony of W. A. Doble, Jr.)

that the installations you make are tight, that is, that the shaft tubing does not receive water?

Mr. TOWNSEND.—I believe that would be a stipulation against the truth, that all of the shaft tubings are tight. Many of them are. I am willing to stipulate that the pump they have there, that they test it, and if they show it to be tight under [748] its present conditions, then it is tight. But if put up again and used, it is a noninfringing structure, it is a circulatory system working from top to bottom. That is the point we want to make clear.

The COURT.—Very well. You may proceed, gentlemen.

**Testimony of W. A. Doble, Jr., for Plaintiff (In Rebuttal).**

W. A. DOBLE, Jr., called for the plaintiff in rebuttal, sworn.

Mr. WHITE.—Q. State your name, residence, occupation and age.

A. My name is W. A. Doble, Jr. My residence is 519 20th Avenue, San Francisco. My occupation is, one of the executives of Doble, Incorporated, a corporation of California doing a manufacturing business in San Francisco.

Q. What engineering experience have you had, if any?

A. I was a student at Stanford University, and in 1917 passed the examination at Benicia Arsenal, and was appointed first lieutenant in ordnance, and was sent to the Bethlehem Steel Company, in South Bethlehem, Pa. From there, I was detailed to Harvey, Ill., where I established an inspection bureau

(Testimony of W. A. Doble, Jr.)

for the inspection of artillery vehicles for the Government. Since then, I have been connected with the Doble Company, manufacturing steam-power plants, and doing general manufacturing work.

Q. State whether or not on September 6th last you visited the Selby Ranch, in San Mateo County, just out of Redwood City, and there inspected a portion of a pump construction represented as having been sold by the defendant, the Western Well Works, and which pump construction has been referred to by some of the defendants' witnesses?

A. I did.

Q. At the time of such inspection, what was done as regards to [749] removing any of the parts of said pump construction?

A. There was a customary tool head erected, and the head disassembled from the pump, and one section of the pump casing removed.

Q. By the removal of that one section of pump casing, were you enabled to see the hub construction and the tube construction?

A. I was able to see the tube construction, and also to measure the hub.

Q. Have you the measurements you made at that time of the hub that you examined in this pump?

A. Yes, I have that.

Q. Just state what those measurements were.

Mr. TOWNSEND.—If your Honor please, that is entirely immaterial and irrelevant; it is not rebuttal; and, furthermore, this witness has shown no qualifications to testify about pumps.

Mr. WHITE.—He is only going to testify as to

(Testimony of W. A. Doble, Jr.)

certain measurements. I think you will find that his measurements correspond to your standard construction here.

Mr. TOWNSEND.—It is wholly irrelevant.

The COURT.—The objection is overruled.

Mr. TOWNSEND.—Exception.

A. I measured the hub that was connected to the tube casing that was projecting from the well, and I found that the largest diameter of the hub was 25/1000ths over  $2\frac{1}{2}$  inches at the large end, and was 30/1000ths, less than  $2\frac{1}{2}$  inches at the small end.

Q. What was the nature of the taper? Was it uniform, or not, from end to end of the hub?

A. Apparently, the taper is uniform. It is a taper from one end to the other. As this one shows, it is not exactly a straight taper. However, it does taper from the small end to the large end.

Q. Have you made any measurements of Defendants' Exhibit "C"? [750]

A. I have measured that, and it is also 25/1000ths larger than  $2\frac{1}{2}$  inches at the large end.

Q. What about the small end?

A. The small end is 38/1000ths smaller than  $2\frac{1}{2}$  inches.

Q. How does that correspond with the Selby ranch pump construction?

A. It is 3/1000ths of an inch smaller. I noted in checking all of their hubs that where I had several of them together they all corresponded exactly, but where the groups were separated there was a small variation at the small end of the taper, but at the

(Testimony of W. A. Doble, Jr.)

large end of the taper, they were all exactly 25/1000ths over 2½ inches.

Q. Did you make a measurement of the interior diameter of the tube section in this Selby pump construction, and if so, what was it?

A. I measured the reamed section of the tube, and found that it was 2½ inches, as near as I could measure it; and that at the forward end, for about 7/8 of an inch it was tapered. I did not measure that taper.

Q. By "tapered," you mean it was bell-shaped at the end of the tube?

A. The tube was bell-shaped to correspond to the taper on the coupling.

The COURT.—Q. For what length?

A. About 7/8 of an inch; it varied slightly from 1 inch to 7/8.

Mr. WHITE.—Q. At the time of the removal of this tube section and the water-discharge section, did you notice any phenomena there which would indicate what the condition of the shaft-enclosing casing was from the pump up to the surface, in respect to the tightness of the joints?

A. I noticed that when they raised the pump, that little bubbles of air and grease were drawn in at the bearing, showing there was a vacuum in the tube. I did not measure it, but that lasted for a considerable [751] time, over 15 or 20 minutes, the drawing in of air at that bearing.

Q. At what point would that vacuum be created in the length of the tube?

A. It would be created at the bottom as the water

(Testimony of W. A. Doble, Jr.)

tended to seek its own level in the well.

Q. As I understand you, then, when the pump was lifted and this tube section was removed, there was some water carried up in the interior of the pump? A. Yes.

Q. And after the lifting of the tube and pump, that water receded in the well? A. Yes.

Q. And that is what caused this vacuum?

A. Yes.

Q. And the fact that that vacuum from the point was communicated up to the top end of the shaft-enclosing tube indicated what, in respect to the tightness of the various joints in such shaft-enclosing tube or casing?

A. It indicated that the length of tube was tight, that all the joints were tight, and that the only entrance that the air could make to relieve the vacuum was through the bearing which was exposed to the atmosphere where we were watching it.

Q. If there had been any holes in that shaft-enclosing casing, intermediate the pump section where that vacuum was created and the top of the tube section at this bearing, would the bubbles you have described appear at the top?

Mr. TOWNSEND.—That is objected to as leading, in the first place, and, secondly, as calling for the speculation of the witness, and without qualification.

The COURT.—The objection is overruled.

Mr. TOWNSEND.—Exception.

A. If there were any holes in the castings, such as sand holes, or if any of the joints were loose, the



(Testimony of W. A. Doble, Jr.)

phenomena that we saw would not have been there, we would not have witnessed it. [752]

Mr. WHITE.—Q. Why?

A. Because the air we saw being drawn in, and the grease, were being pulled through a shaft bearing, and if there were any holes, the vacuum would have gotten in there very much more easily, and would have been relieved without having been drawn through the long bearing.

Q. In other words, if there had been any opening anywhere intermediate the pump, and the top bearing, the vacuum would have been relieved by the air rushing into those holes instead of rushing in at the top bearing: Is that correct?

A. Yes, that is correct.

Q. What kind of instruments did you use in making these measurements?

A. In the tube, I used an inside micrometer, and on the hub I used a caliper, and checked that with an inside micrometer.

Q. What was the condition of the joint between the hub and one end of the tube that was separated at the time of this test or inspection?

A. The top tube bearing was disassembled with the tube, and left on it; it took quite an effort to remove that off the taper, to remove the tube from the taper of that top bearing.

Q. What was the appearance of the metallic surfaces of the hub and the interior of the tube at the second joint? A. That is not at the top.

Q. The second joint from the top?

A. There was a very thin coating of compressed

(Testimony of W. A. Doble, Jr.)

white lead on the hub; and inside the tube there was a very thin coating of white lead, which I with much effort, removed with a rag; but I noticed the top was burnished where it had been pressed up on the taper, it was actually polished, showing that it was expanded on that taper.

Q. How was that burnishing brought about?

A. The burnishing [753] was brought about by forcing the tube on the taper, the expanding of the tube as it was forced upon that taper.

Q. What was the condition of the shaft at this joint?

A. The shaft was polished; it was clean and polished, and showed no signs of water.

Q. What was the condition of the shaft above the top joint bearing?

A. Where the shaft was exposed to the atmosphere it was rusty.

Q. At this second joint, did the tubing seat on the seat of the hub? A. It did.

Q. What have you to say in regard to that fact, in respect to the top-most joint?

A. It did not quite seat, and was slightly rusty.

Q. What was rusty?

A. The end of the tube, whereas in the second joint the tubing was polished, like new, showing that no water had gotten in there from the discharge.

Q. What was the condition of the top-most hub?

A. Do you mean the bearing or the flange?

Q. Between the seat of that hub and the end of the tube.

(Testimony of W. A. Doble, Jr.)

A. Very slightly rusted.

Q. What was the condition of the portion of that hub underneath the tube, as you observed it when the tube was removed?

A. It was polished; it was just as if new; it was just as good as that hub right there.

Q. What was the condition of the shaft-enclosing tube, the exterior of the tube?

A. The lower portion of it was very rusty and eroded; the top end of it, where the water turns to go out, the outlet was very much eroded, and it showed perceptibly.

Q. What about the condition of the interior of the shaft-enclosing [754] casing, that is, the section that was removed?

A. The interior was very greasy; it had absolutely no rust in it; it looked as though it were a new tube.

The COURT.—We will take a recess now, gentlemen, until two o'clock.

(A recess was here taken until two o'clock P. M.)  
[755]

#### AFTERNOON SESSION.

W. A. DOBLE, Jr., direct examination (resumed).

Mr. WHITE.—Q. At the time of inspecting this pump at the Selby ranch did you make any measurements of the outside diameter of the tube, at the end thereof, which was on the hub?

A. Yes, I cleared off the outside of the tube, that is, I cleaned the rust off of it; I micrometered the tube about one-half inch back from the end, and

(Testimony of W. A. Doble, Jr.)

there I found a diameter of 3 inches less  $36/1000$ ths. Then I micrometered the other end and found there a diameter of 3 inches minus  $19/1000$ ths, making a total expansion of the tube of  $17/1000$ ths of an inch.

Q. From that data, what have you to say in regard to the contact between the interior of the tube end and the outer surface of the hub?

A. I would say that between the tube and the hub there was a perfect surface contact for approximately  $7/8$ ths of an inch.

Q. Did you make a measurement of the interior diameter of the gage which was produced here by the witness, Conant? A. I did.

Q. What is that interior diameter?

A. It was  $2\frac{1}{2}$  inches plus a full  $1/1000$ ths of an inch; in other words, it was  $1/1000$ ths of an inch large.

Mr. WHITE.—Mr. Townsend, you have produced here a pipe section or tube section, but you have not referred to it, and no witness has referred to it. Can you tell me if this is one of the standard tube connections used by the defendant in its pump construction, or was this produced as an exemplar of such standard construction?

Mr. TOWNSEND.—Why it happens to be here I don't know. It [756] has not been introduced. I have no objection to giving you any information I can get.

Mr. WHITE.—Q. Have you made a measurement of the interior diameter of this tube section referred to? A. I have.

Mr. TOWNSEND.—I am informed that it is one

(Testimony of W. A. Doble, Jr.)

of the short top sections of the regular Western Well Works casing; I believe that they have two lengths of tube sections, the one being somewhat shorter than the other.

Mr. WHITE.—Q. What did you find to be the interior diameter of this tube section which has just been referred to?      A.  $2\frac{1}{2}$  inches.

Q. How does that interior diameter compare with the interior diameter of the tube section that you examined at the time that you visited the Selby ranch, and also examined at the time that you went to the Palo Alto ranch, where you saw some of these tube sections?

A. Back about an inch from the end they were all approximately  $2\frac{1}{2}$  inches.

Q. What is the diameter of the reamed-out section at the end of each one of these tubes?

A. That is the  $2\frac{1}{2}$ .

Q. You mean to an extent of  $2\frac{1}{2}$  inches back that is the diameter?

A. Not that; I mean  $2\frac{1}{2}$  inches—I had to measure back from the end, because the tube was flared; it had been expanded on putting on the coupling, and when I measured back of that the diameter was  $2\frac{1}{2}$  inches as it was reamed.

Q. Will you apply this tube to the hub in Defendants' Exhibit "C" and state how far down the end of the tube extends on the hub, or at least how far the end of the tube is from the seat on the hub before you have to apply pressure to drive the tube further onto the hub?

A. Of course, that goes down a little by its own

(Testimony of W. A. Doble, Jr.)

weigh, but that is approximately  $\frac{5}{8}$ ths of an inch.

Q. In order to seat this tube on a seat of the hub, would or would [757] you or would you not have to apply force?

A. You would have to apply a tremendous force, because that tube has to be expanded almost  $\frac{25}{1000}$ ths of an inch to seat on the hub here.

The COURT.—Try the other end.

A. That is also  $\frac{5}{8}$  of an inch. Both ends are of the same interior diameter.

Mr. WHITE.—Q. In view of the identity of these measurements, what have you to say in regard to the fineness of the machine work used in constructing these tube ends, or reaming them out?

Mr. TOWNSEND.—That is objected to as immaterial, and as not rebuttal, and no foundation laid.

The COURT.—Overruled.

A. The accuracy of the workmanship on the tapered hub and on the interior of the tube is extremely high. It is a very high grade of workmanship, and they are very accurate.

Mr. WHITE.—Q. You mentioned the fact that when you examined this pump at the Selby ranch a portion of the hub was rusted, and the end of the tube was rusted. Will you point out on this structure, Defendants' Exhibit "C," the part of the device you referred to as being rusted?

A. It was the top screw bearing that was rusted, or the shoulder that meets the end of the tube. Apparently, from looking at it, it looked like, as it made a tight joint, as though the tube had wet this shoulder here on the screw top bearing.

(Testimony of W. A. Doble, Jr.)

Q. Pointing to the model?

A. Pointing to the model. You see, they have shown that on the top bearing, and this tube, apparently, as far as we could see, butted right up against that, and when we took it apart it was slightly rusted on this [758] surface, and on that surface, showing that there was a little crack in there that moisture had penetrated through, but that the interior of the tapered surface of the hub and the tube were perfectly bright, perfectly polished; there was no sign of water deterioration whatever.

Q. I presume that simply indicated to you that where these parts were exposed to the water this corroding effect resulted? A. Yes.

Mr. WHITE.—Will you permit us to introduce in evidence this tube section that you have produced?

Mr. TOWNSEND.—Yes.

Mr. WHITE.—I will offer that tube section in evidence and ask that it be marked "Plaintiff's Exhibit 18, Defendants' Enclosing Shaft, Tube Section."

Q. You stated that it would require some considerable force to seat one of these tubes on the hub. Will you state how that pressure is exerted in the assembling of one of these defendants' devices?

A. The pressure exerted to force that tube up on the hub is exerted by screwing the two adjacent couplings together onto the tubing, and that forces the tube at either end on the taper of the hub.

Mr. TOWNSEND.—You are speaking of the

(Testimony of W. A. Doble, Jr.)

tube section, now, adjacent to the pump outlet?

A. I am speaking of the outlet pump casing; the couplings are screwed on it, and in doing so they force the inner tube up on the cones of the couplings. That is, I am speaking of this tube 9a. These two couplings, 17a and 17b are screwed on that, and as the threads wind up on each other, it forces this inner tube up on the taper of the hub.

Mr. WHITE.—That is all. [759]

Cross-examination.

Mr. TOWNSEND.—Q. I understand, Mr. Doble, that when you pulled this Sherrer pump on the Selby ranch Monday last, that you observed, as you pulled it up from the well, the entry of bubbles around the top tube bearing. Will you state again what created the bubbling action that you saw there?

A. As the pump, the whole pump casing and pump were raised from the well, the water in the pump lowered to the level of the water in the well, and the lowering of that water in the pump casing reduced the pressure below atmospheric in the outer discharge column of the pump.

Q. You say the water in the pump.

A. I mean in the inner pump column.

Q. You mean in the shaft tubing?

A. That is what I mean, the shaft tubing.

Q. Where did that water get to?

A. It went into the well; as the pump was raised, the water that was in the inner casing lowered and went into the well.

Q. The water in the tube line?



(Testimony of W. A. Doble, Jr.)

A. In the protective tube.

Q. How did it get into the well, what was its outlet?

A. I imagine it went through the runner. I don't know. I could not see that. There was a lowering of pressure, because you could see the grease going in between the shaft and the bearing—you could see grease going in there, being drawn in.

Q. What would be the likely means of outlet for the water in the shaft tube?

A. I could not tell you.

Q. How did you know that was a defendants' pump?

A. From all appearances it was the same as what I have seen here.

Q. How much of it did you see?

A. I saw the head and about one and a quarter sections.

Q. You saw the section that connects immediately with the pump head? [760] A. Yes.

Q. How great a length of that pump did you see?

A. I saw, I should judge, about six feet. The top head and about six feet below the surface.

Q. Didn't you see any more of the pump construction below?

A. I did not, other than what I could look down the well and see.

Q. Was that a bored well, or pit well?

A. I imagine it was a bored well; it had a casing; I am not familiar with wells in general.

Q. Do you know how deep that well was?

(Testimony of W. A. Doble, Jr.)

A. I don't know.

Q. Do you know where the water level was?

A. I do not.

Q. Do you know how far the water level was below the surface?     A. No.

Q. Do you know what the length of the pump column was?     A. I do not.

Q. You then, of course, would not know how many tube sections there were?     A. I do not.

Q. You would not know whether the tube sections and the pump discharge column were submerged, would you?

A. No, I don't know whether the pump was submerged—what portion of it was submerged?

Q. Of course, you would not know whether that pump was a Western Well Works pump or not, if you could not see the drain tubes or see the lower sections?

Mr. WHITE.—I think the defendants' witness admitted this morning that was one of the Western Well Works pumps which had been substituted for the United Iron Works pump; if there is any dispute about it we can go ahead and prove it.

Mr. TOWNSEND.—I want to know what this witness knows.

Mr. WHITE.—That is immaterial, whether the witness knows [761] it, or not. If you dispute the fact, we can prove it. If it is a fact, we can save time by having it admitted.

Mr. TOWNSEND.—I want to get his testimony.

Mr. WHITE.—Q. Assuming that was a West-

(Testimony of W. A. Doble, Jr.)

ern Well Works pump, and had the drain tube down there, would not water likely have gone out from the interior tube shaft as you raised the pump through the drain tube?

A. If those drain tubes were connected clear from the inner tube to the outside of the well, it would have, and if they were not stopped up—the water from the inner tube would have gone into the well.

Q. Had you any reason to suspicion that that pump did not have the drain tubes?

A. I knew nothing about that.

Q. I am asking you, did you have any reason to suppose that that pump was not provided with drain tubes which would function as they are supposed to function?

A. No, I did not see that.

Q. That is not an answer to my question.

The COURT.—He answered “No.” That is a direct answer to your question?

A. I don’t know.

Mr. TOWNSEND.—Q. Then would not the likelihood be as that pump was raised that the water would flow out through these drain tubes as one medium of exit?

A. If those tubes were, as I have stated, connected to the inner tube and to the well, as the pump was raised, the water in the inner tubing would flow out into the well.

Q. Through these drain tubes?

A. I don’t know whether it would go through these drain tubes, or other drain tubes, but if they were clear and there were no other openings it might go through these. I could not say positively,

(Testimony of W. A. Doble, Jr.)

because I could not see it. [762]

Q. We are trying to use common sense now. We will assume that that pump that you saw down there was identical in construction with either this model V or Plaintiff's Exhibit 4, both of which exhibits show the drain tubes, which in the model V are marked 28. If that casing had water in it and you raised it, does not common sense teach you that the water would flow out of these drain tubes into the well? A. I do not see what would—

Q. (Intg.) Can't you answer my question, "Yes" or "No"?

A. Yes, I believe water would flow out of that if it was raised.

Q. Now, supposing these drain tubes are there, how did the water get into the tubes in the first place?

A. I imagine that it would be just the reverse action, from the well, and it went into the tube and through that little bearing there, into the inner casing.

Q. And any other means of communication which might be between the discharge water and the interior of the tube?

A. Yes, any other ones that might be there.

Q. Did you notice that pump that you saw there on the Selby ranch having any means of lubrication at the pump head? A. I did.

Q. What was that means of lubrication?

A. The part that I saw was not exactly like this; the construction was slightly different; but the fundamentals were about the same. They had a

(Testimony of W. A. Doble, Jr.)

drill and tap hole in the upper end of this top bearing, and apparently there had been a pipe screwed on there; it was off when I saw it, but this top part was filled with grease, and undoubtedly that was how they were feeding down the shaft. I saw no signs of oil.

Q. Who took off that pipe?

A. I don't know who took off the pipe. I was not there when it was taken off.

Q. Do you know when they first started to pull that pump? [763]

A. I was there when they first started to lift the pump from the well.

Q. But other members of your party were there ahead of you?

A. There was a wrecking crew there before I was there.

Q. A Layne & Bowler wrecking crew? A. Yes.

Q. Now, you pulled one section; how many feet did you say you pulled out of that pump?

A. Approximately six feet; I could not say exactly.

Q. How many sections did you examine?

A. What do you mean?

Q. How many sections of the tubing, of the shaft-enclosing tubing, did you examine?

A. I examined one on the ground, because we only took one out of the well.

Q. You examined but one? A. But one.

Q. What was the interior condition of that tube?

A. It was very greasy, and after rubbing, taking that grease out with a rag, the interior of it looked about the same as the interior of this right here.

(Testimony of W. A. Doble, Jr.)

Q. You say "very greasy." What do you mean by that,—how greasy?

A. That is very hard to answer.

Q. Was it a film?

A. No; it was a good thickness of grease, about a quarter of an inch—I did not measure it, but it was somewhere in that vicinity; it was a good quantity of grease.

Q. Was it uniform, or in lumps here and there?

A. I don't remember exactly. I don't think it was exactly uniform.

Q. Approximately, what did it appear to you like?

A. It was not in large lumps; it would be pretty smooth, you might say, that is, it was not in large projections out into the tube.

Q. Was there any clearance between the grease layer and the interior shaft? A. Yes.

Q. There was a clearance there? A. Yes. [764]

Q. How much clearance was there?

A. I could not answer that question.

Q. You did not measure that?

A. No, I did not measure that.

Q. Did you see anything there that would, to your mind, interfere with the action of lubricant, oil, dropped in at the top bearing and passing from bearing to bearing through that shaft-encasing tube?

A. First of all, there was that little top cup that was filled with grease; I could not say that any oil could get through it.

Q. You say something was taken out of there. I am assuming oil would be fed in there at that top tube bearing. Did you observe anything that would

(Testimony of W. A. Doble, Jr.)

create an obstruction or interpose an obstruction to the free passage of oil fed into the top, down the shaft, bearing to bearing, through that shaft-enclosing tube? Answer my question "Yes" or "No."

A. Yes.

Q. What did you see that would interfere?

A. The grease on the shaft, grease on the casing.

Q. You said there was a clearance between the shaft and the film on the interior of the casing, did you not?

Mr. LYON.—I object to that as not a correct statement of the witness' testimony.

Mr. TOWNSEND.—He said there was a clearance.

The COURT.—If that is not a correct statement of what he said, he may make the correction. I understood him to say there was a clearance.

A. I did not look at it in position with the tubes and the shaft in place.

The COURT.—Then you did not mean to say that when the shaft was in there was a clearance between the shaft and the film?

A. I believe there would have been, from the very [765] best evidence that I could give. I actually did not see it that way.

Mr. TOWNSEND.—See if you can answer my question: I am trying to put a fair question to you.

The COURT.—As I understand, the question is if oil is introduced at the top by an oil device, would it, in your judgment, follow on down the shaft through the various bearings, and if not, why not?

A. I don't think it would have.

(Testimony of W. A. Doble, Jr.)

Mr. TOWNSEND.—Just answer the rest of the Judge's question.

A. Because the grease on the shaft and on the tubing would seal the small passage tubing.

Q. You have stated that there was a clearance between the tubing and the exterior of the shaft, even in spite of the oil film on the interior of the tube, haven't you?

Mr. WHITE.—He has stated that was his belief.

The COURT.—He has so stated, according to his belief.

Mr. TOWNSEND.—Q. Would that offer a natural conduit for the gravity flow of a mobile fluid, mobile liquid?

A. That is, in that section it would, but it would not to all the bearings in the well.

Q. Did you observe the nature of those bearings?

A. I did.

Q. Did they have the spiral groove in?

A. They did.

Q. From your experience and knowledge as an engineer, do you know what the action of that spiral groove would be on any matter on the shaft coming down in contact with the bearing?

A. I believe I do.

Q. What would it be?

A. It would help to distribute the lubricant that was in that groove.

Q. And act in a worm fashion, like a screw propeller, to carry [766] whatever was on that shaft down through it, would it not?

A. To a small extent.



(Testimony of W. A. Doble, Jr.)

Q. Have you ever made any tests on the screw action of a rapidly-rotating shaft in a groove bearing?

A. I don't understand your question.

Q. Read it.

(Last question read by the reporter.)

A. No, I have not.

Q. Very well. You admit, though, that it would have the tendency to carry the matter through?

A. Very slight.

Q. Well, now, having gotten it through, would there below, and as far as your observations went, be an opportunity for a fluid lubricant to reach the next bearing?

A. I think it would meet the same hindrance right in the next bearing.

Q. But if it got to the bearing, that lubricant would perform its function, would it not?

A. It would if it got there.

Q. Can you state what the action of a rapidly-rotating,—a shaft rotating 1100 or 1200 R. P. M., would be on any lubricant placed upon it, or flowing upon it?

A. It would tend to throw it off.

Q. By centrifugal action. Wouldn't that be an explanation of the accumulation of the grease or oil that you saw in the interior of the tube?

A. Yes, partially so.

Q. Did you have an opportunity to observe that pump in action?     A. I did not.

Q. Who was in your party that visited the Sherrer ranch the other day?

A. There was Mr. Lyon, Mr. White, and Mr. Doble,

(Testimony of W. A. Doble, Jr.)

Sr., and myself, and the rest of the crew.

Q. Was Mr. F. H. Hermann, vice-president of the Layne & Bowler Company present?

A. I beg your pardon, he was there also. [767]

Q. Who was it in your party that stated to Mr. Sherrer, the owner of that pump, that you had an order signed by this court permitting you and your party to pull that pump, and that if he did not permit that pump to be pulled the sheriff would come and do it?

Mr. LYON.—We object to that question as, first, not cross-examination, as assuming a fact not in evidence, and on the further ground that it is incompetent, the witness not having testified that he knows of any such thing, and we deny the inference in the statement.

Mr. TOWNSEND.—I only wanted to bring it up here so that the court might decide whether the dignity of the court has been offended.

The COURT.—We are not interested in that at the present time. It is introducing a collateral issue.

Mr. WHITE.—I can assure counsel that nothing of that kind took place.

Mr. TOWNSEND.—We have been assured to the contrary, your Honor.

The COURT.—You might try the issue out in the corridor.

Mr. TOWNSEND.—Q. You concluded that the water got down the tube line when the pump was lifting, evidenced, you say, by the air bubbles that passed around the top tube bearing?

A. I don't understand the question.

(Testimony of W. A. Doble, Jr.)

Q. Read the question, Mr. Reporter, and if it is not clear I will make it clear.

(The last question repeated by the reporter.)

A. The evidence of the reduced pressure in the tube line was from the grease being drawn in at the top bearing.

Q. And that was due to the lowering of the level of the water in the tube line?

A. In the inner tube line. [768]

Q. Now, Mr. Doble, if water would flow down the tube line, wouldn't oil flow down the tube line, too?

A. I couldn't see where that water was.

Q. Please answer my question. A. It would.

Q. That is, it would find exit at the same place as the oil, would it not? A. Presumably it would.

Q. And if that exit was at these drain tubes, No. 28 in model V, the oil would find the same outlet, would it not? A. Presumably it would.

Mr. TOWNSEND.—That is all.

Redirect Examination.

Mr. WHITE.—Q. Did you examine one of these spiral bearings, or grooves in the bearings?

A. I did.

Q. What did you find with regard to its condition?

A. It was filled with grease.

**Testimony of W. A. Doble, for Plaintiff (In Rebuttal).**

W. A. DOBLE, called for the plaintiff in rebuttal, sworn.

Mr. LYON.—Q. Please state your name, age, residence and occupation.

(Testimony of W. A. Doble, Sr.)

A. William A. Doble; 52 years old; residence, 190 Seacliff Avenue, San Francisco; occupation—you mean my profesion—hydraulic and mechanical engineer.

Q. In connection with that profession, with what companies have you been connected, and in what capacity?

Mr. TOWNSEND.—In order to shorten time, we admit Mr. Doble is a qualified mechanical and hydraulic engineer, and we will wait until he gets to some specific point which may require more knowledge of his qualifications on that particular subject.

The COURT.—Very well. [769]

Mr. LYON.—Q. You have heard the testimony of your son, Wm. A. Doble, Jr.? A. Yes.

Q. You were present on Sunday last, and also on Monday, when trips were made, first to the Palo Alto ranch of Sherrer, and then to the Selby ranch?

A. Yes.

Q. Were you present while the pump at the Selby ranch was pulled last Monday?

A. I was present during the pulling; at the time we got there the pulley was off, the lubricating pipes were disconnected, the top pulley bearing was off; the regular pump head and the pump was intact, and they were setting up the tripod or derrick to lift the pump when we got there.

Q. Please go on in your own way and explain what you observed with regard to that pump at that time, particularly with regard to the shaft-enclosing casing, and the method of lubrication?

Mr. TOWNSEND.—If your Honor please, this is

(Testimony of W. A. Doble, Sr.)

a mere duplication, which I think is wholly unnecessary, going into the detail of what these parts show.

Mr. LYON.—If you are willing to concede that Mr. W. A. Doble, Jr.'s, testimony in that regard is correct, we will pass along.

Mr. TOWNSEND.—I don't know what you are going to prove by this witness, any more than what Mr. Doble, Jr., has testified to.

The COURT.—Perhaps we can get at it in this way: Will you admit that this witness will testify substantially the same as his son did, who was just on the witness-stand?

Mr. TOWNSEND.—Yes.

Mr. LYON.—Q. Mr. Doble, are you familiar with the patent in suit?     A. Yes.

Q. Have you examined, and are you familiar with—

The COURT.—I intended to ask the preceding witness a [770] question; perhaps I might ask this witness. There is no other way of lubricating this pump except the one suggested, that is, by the lubricant going through this spiral orifice or groove?

A. It is not a spiral groove, it is a helical groove, and at the top of this upper bearing, it is chambered out, and connected with that chamber is a hole threaded out for apparently an oil cup, and the oil feeds from that down through the bearings; the only other source of lubricant would be the lubricant that was put in the pump at the time it was installed.

Q. What I am trying to get at is this: If this groove becomes stopped up so that it will not function, do the bearings become dry?

(Testimony of W. A. Doble, Sr.)

A. If the groove becomes stopped up so that it would not function sufficiently, the bearing would become dry, but, due to the rotation of the shaft, and this helical groove, the rotation of the shaft gradually draws the grease out of that groove and distributes it over the surface of the bearing; but its real function is to prevent too rapid a flow of grease through it. If you had a vertical grove, the flow would be too rapid; but by the helical groove, the distribution is much more complete; it serves the purpose of preventing too rapid a feed of the lubricant.

Q. Your idea is in this particular device this groove would not become stopped up so that it would not function?

A. Oh, no, I would not expect it to, not unless the grooves were in very bad condition. Each one acts as a packing gland, because it has that grease, and the grease is constantly provided for the lubrication of the shaft, which means simply a film of grease between the rotating element and the stationary element. Now, you will appreciate that this stationary element is grooved; the helix is on the stationary element, [771] whereas if it were on the rotating element then it would act like a propeller or any other screw action, and pull the lubricant through more rapidly. But the grooves being the static element, the stator, as it were, act as distributors and insure against the lubricant going through on one side without lubricating the entire bearing.

Q. Is it for impeding rather than accelerating the passage of the lubricant?

A. I should say my own opinion of the thing is that

(Testimony of W. A. Doble, Sr.)

a helical groove, from experiments I have made, does retard, as compared with a longitudinal groove, where it would run through with the helical element rotated, it would accelerate the flow through; but the only thing that you have to accelerate the flow is that frictional contact between the rotating shaft and the surface of the grease, whereas, to overcome that, there is a static condition of a very much greater surface, due to the groove in which the grease is poured. Then, of course, to assist in going through, you have the force of gravity. The prime object, in my opinion, is to assure a more perfect distribution of the lubricant on the shaft surface.

Mr. LYON.—Q. Have you read and are you familiar with Defendants' Exhibit "W," the Halstead patent? A. I have read the Halstead patent.

Q. And with Defendants' Exhibit "G," the Eisler patent and Defendants' Exhibit "H," the Crannell patent?

A. I have read both the Eisler and the Crannell patents.

Q. And have you examined and are you familiar with Plaintiff's Exhibit 4, the so-called Anderson pump? A. I have and am.

Q. Will you take the patent in suit and very briefly state what therein you find with regard to lubrication, enclosure of shaft bearings, and alignment of the bearings, and very [772] briefly compare those features with the features, in so far as they will compare, with the Halstead patent, and Crannell patent, and Eisler patent, and with Plaintiff's Exhibit 4, the Anderson pump.

(Testimony of W. A. Doble, Sr.)

Mr. TOWNSEND.—That questions, calling for a comparison, is objected to because it is the function of the Court to make the comparison. It is all right for him to analyze each of these patents from his own viewpoint, but it is for the court to draw its own conclusion on a comparison of them.

The COURT.—I suppose the purpose is to assist the court.

Mr. LYON.—I would like to say, in this connection, that I am offering the testimony of this witness as to the prior art, of course subject to your Honor's ruling when ultimately made on the question of estoppel.

The COURT.—Yes.

A. Referring to the patent of M. E. Layne, No. 821,653, the patent in suit.

Mr. LYON.—Make your explanation in regard to that short, as to the features I have referred to, because the patent has been referred to in detail before.

A. With reference to these points, the patent provides in combination a shaft-enclosing tube associated with the bearings, forming a conduit to furnish lubricant to the several bearings in series. It further provides a protection, in combination with the bearings surrounding the shaft and protecting the bearings and the shaft from the action of the water being pumped and any sand or detritus carried by the water. Furthermore, this combination provides a series of shaft-supporting and aligning bearings placed at suitable intervals between the ends of the shaft, making one combined structure, being a pendant [773] power transmission to transmit



(Testimony of W. A. Doble, Sr.)

power from the surface of the ground or the top of the well to a pump located within the bore of the well. That is, it provides in this combination a support and an alignment of the bearings, a lubricating system for the bearings in series, and a protection of the shaft and bearings against the corrosive action of the water or any sand or detritus carried by the water.

The next patent is that of Crannell. In Crannell I find a pump that is not designed for a bored well; it is not a pendant structure, being supported in an open pit, on the bore of the pit, and there are no shaft-supported or protected bearings in the sense of the Layne patent. The only bearing shown is below the impeller, and is marked 9, and is subject to the action of the water in the well when being pumped and any sand or detritus carried. There is not shown or indicated any means of lubrication of that bearing. Were a lubricant poured into the pump stock, as it is called, it would not reach any bearings of the pump. The pump does not involve a series of shaft-supporting and aligning bearings, protected against the action of the water or sand or detritus carried by the water, nor does it provide a lubricant conduit for the bearings. It is an open pit construction for low lifts.

The Eisler patent, Defendants' Exhibit "F," is a low-lift water elevator, and the bearings of the shaft, that is, bearings 18 and 14, are subject to the action of the water. The pump differs entirely from the principles and invention of Layne in that it is not a pendant structure; it is arranged to be supported on

(Testimony of W. A. Doble, Sr.)

the floor of an open flume or canal; the lower bearing is submerged directly in the water, it is subject to the action of the water, and any sand or detritus carried by [774] the water. It is provided, however, with a rotating inlet in an effort to partially protect this bearing. The bearing No. 18 is located in a rectangular wall above the runner, and there is no means, however, to feed lubricant through this rectangular wall, nor any way to protect this bearing No. 18 from the action of the water, as the pressure of water would force the water through the bearing; the lubrication system is entirely different; instead of being a series lubricating system, and carrying the lubricant from bearing to bearing, step by step, down through a tube, there is a parallel system wherein there is a vertical tube with branch pipes to the center of each bearing, and the lubricant would be expected to feed into these several bearings. In practice, we have found that will not work, because sometimes one bearing will take all of the oil, and the other bearing will not get none, particularly, the bearing at the bottom would get the greater portion of oil. The pump is different in principle, and mode of operation, and the result secured, from the Layne patent. The central well, which is stated in the patent would be free from water, could not possibly operate that way, as the water would go up through the bearing and would quickly fill this central well to the height to which the water was being pumped.

The COURT.—The water would pass out where?

A. Right out through this bearing. There is no

(Testimony of W. A. Doble, Sr.)

pressure of grease on top to retard it, because the oil simply comes in on the side and whatever loosens would pass up and the central well would fill up. It is, further, not a pendant structure, and could not be inserted in a bored well.

The Halstead patent, Defendants' Exhibit "W," has in a pendant pump construction, suitable for bored wells, a series [775] of shaft supporting and aligning bearings, spaced at intervals, suitable intervals, between the ends of the shaft. Associated with the bearings is a tubular structure, which would thereby protect the shaft and bearings from the action of the water being pumped, and any sand or detritus carried by the water. And this tube provides a conduit for lubricant to the several bearings in series, and embodies in this structure the three essential elements forming the combination in the Layne invention.

Mr. TOWNSEND.—If he is going to compare the plaintiff's patent with the defendant's structure, that is not proper rebuttal. That was a part of their opening case. It opens up a great field on which we have had no opportunity to know their views. They have put in their opening case, and made their comparison with the Layne patent, and now this is not rebuttal.

Mr. LYON.—That would be true to a great extent, were it not for this fact; the question asked the witness is not solely as to the Layne patent and the alleged infringing structure, but it is a comparison of those two together. They are asserting that they are operating under the Halstead patent,

(Testimony of W. A. Doble, Sr.)

and I want the witness to answer particularly, after comparing the Layne patent and Plaintiffs' Exhibit "4," which the Halstead patent refers to. In other words, their contention is they are operating under the Halstead patent, and I am going to point out the differences between this structure and how it approximates the Layne structure, and where it differs from the Halstead are the very features of the Layne patent.

Mr. TOWNSEND.—A comparison is proper enough if he wants to compare defendants' structure, Exhibit "4," with the Halstead [776] patent, but it is not proper at this time and at this stage of the case to compare that structure which has been introduced in the *prima facie* case to prove infringement with the Layne patent in suit.

Mr. LYON.—Limit your comparison, as far as the Layne patent in suit is concerned, and Plaintiff's Exhibit "4," to the flow of lubricant in the column, in the encasing column, and particularly with relation to any circulatory system, so-called, or stagnant pool system.

Mr. TOWNSEND.—I make the same objection, because it is part of the *prima facie* case. Any comparison between that structure which is introduced in the *prima facie* case and the patent in suit should be made, then, and we should be given an opportunity to answer. We have answered everything that they have put forward.

The COURT.—Sustained.

Mr. LYON.—Q. Mr. Doble, calling your attention to the Halstead patent, Defendants' Exhibit

(Testimony of W. A. Doble, Sr.)

“W,” what is the function and mode of operation of the drain tubes, 28? What do they serve? What purpose do they serve, and how do they operate?

A. Reading from the Halstead patent, Defendants’ Exhibit “W,” page 2, commencing with line 53:

“It will be observed that channel 27 is placed a short distance above the lower end of bearing 17. This is done so that the lubricating emulsion will traverse the greater portion of the bearing before draining away. That portion of the bearing below channel 27 will not be lubricated, because the upward pressure of the water being raised will tend to force a small amount of water in the direction of the arrow upward through the bearing, until the channel, 27, is reached, where it will [777] be drained away through auxiliary conduits, 28.”

That would be the action.

Q. What effect, if any, would that action have toward excluding water or sand from the tube enclosing casing during the operation of the pump?

A. That would be the mechanical equivalent of a stuffing-box, or any other form of resistance for which a resistance-box is commonly used.

Q. Why?

A. Because the water, being forced up by the pump due to the pressure—and I am now speaking of a multi-stage pump—in passing through the lower half of that lower bearing, and until it reached the chamber, 27, which has free opening into the well

(Testimony of W. A. Doble, Sr.)

in the port, 28,—that water would freely discharge back into the well; in other words, would be short-circuited and would not be forced, as the patent herein states, up into the upper part of the bearing which forms the lower end of the shaft-encasing column, and therefore that acts as an interference, or as a packing gland and protects the shaft from water being forced in there during the operation of the pump, and carrying with it sand or grit.

Q. In this respect, how does Plaintiff's Exhibit "4," the Anderson pump, correspond in its action with the Halstead patent description, and what evidence, if any, is there in Plaintiff's Exhibit 4 of such action?

A. Referring to Plaintiff's Exhibit 4 I find the channel, 27, which is shown in the patent drawing, being placed between the ends of the lower bearing, or the bearing immediately above the pump bowl, and from that chamber I find the two conduits, 28, and on examining the shaft of this pump and its bearings, it shows clearly that where the shaft went through the upper bearing it was protected from grease, and the lower part from this point down shows the corrosive [778] action of the water being forced through the bearing. Now, in pumping under high pressure, the water is forced up through this bearing into chamber 23, and is then short-circuited back into the well, where there is low pressure through the channel 28, and, therefore, has not the energy necessary to force itself past the grease in the upper part of the bearing above the chamber 27 and into the shaft tube, and the worn,

(Testimony of W. A. Doble, Sr.)

shiny appearance shows that the shaft in that lower bearing was thoroughly protected, and below that, where the water was forced through the lower half of the bearing it is corroded. The action is just as set forth in the Halstead patent, and, therefore, is the mechanical equivalent of a packing gland. This shaft being laid in position, shows where the water stopped, and then the bowls came on, and the runner is put on the shaft below.

Q. Have you examined the continuation of this shaft above the enclosure, here, as to its condition?

A. I have examined the shaft of Plaintiff's Exhibit 4 above the lower bearing.

Q. What kind of deterioration, if any, by sand or water, did it show?

A. None, whatever. The shaft is in thoroughly good order, clean, free from rust, and covered with lubricant or grease.

Q. What, if anything, does that indicate as to the correspondence of this structure with the description of the Halstead patent, as to the possibility of the entry of water at the joints of the shaft-enclosing casing upon the hubs of the bearings, and the free use of water lubrication in that manner?

Mr. TOWNSEND.—There is no proper foundation laid for what takes place in practice, and this is not rebuttal. [779]

Mr. LYON.—What does it indicate?

The COURT.—He may answer.

A. This shows implicitly that the shaft casing formed a protection against the admission of water

(Testimony of W. A. Doble, Sr.)

and sand which would injure the shaft bearings.

Mr. LYON.—You may take the witness.

Cross-examination.

Mr. TOWNSEND.—Q. Mr. Doble, you have, as an expert, given your advice to the Court in an advisory capacity as to the differences between the structure shown in the Eisler patent and the Layne patent in suit. Now, in fairness, will you give the other side of the proposition, as to the similarities that you find in the Eisler patent and the Layne patent in suit.

Mr. WHITE.—I might say, your Honor, that that is immaterial. Mr. Doble has pointed out the differences in respect to those features forming the subject matter of this suit, so far as the Layne claims in suit are concerned. Even if these devices are similar in regard to other features that have nothing to do with this case, that is absolutely immaterial.

Mr. TOWNSEND.—It is quite material.

The COURT.—He may answer.

A. Referring to the Eisler patent, Defendants' Exhibit "F," I find really the only true similarity is the pulley.

Q. That is the best answer you can make?

A. All of the other features differ materially in the mode of operation and result, and structure.

Q. Are you influenced in your answer by the fact that this shows a square construction instead of a round construction? A. Partly.

Q. Do you consider that an essential difference?



(Testimony of W. A. Doble, Sr.)

A. When you [780] come to ask for similarities, yes, it is an entirely different structure.

Q. Would you consider that this appears to be made of wood, as against the other made of iron, that that is a true difference?

A. That would be a true difference; it makes an entirely different proposition; the question of leakage, and protection, and stability, and the fact that it is not a pendant structure.

Q. I want to get back to similarities. Just eliminate the matter of form and the matter of material of which the thing is made, and see if you cannot give us a somewhat fuller and better answer to my question, to point out the similarities that you, as an engineer, must necessarily see between the Eisler construction and the Layne patent in suit.

A. In pointing out any similarity, I would have to point out wherein it differs.

Q. You have pointed out the differences. Just confine yourself to the question of similarities.

The COURT.—I will permit you to lead him if you wish. Perhaps you could call his attention to certain features and ask if they are similar.

Mr. TOWNSEND.—Q. Referring to page 1 of the specifications, in the paragraph beginning with line 32, you find a pump casing referred to, do you not? A. What are you referring to?

Q. To the specifications of the Eisler patent.

A. The specifications of the Eisler patent, commencing at line 32, say:

“In the said drawings, the letter A, indicates the pump casing or framing, which is composed

(Testimony of W. A. Doble, Sr.)

of a bottom or base piece, 12, from the four corners of which rise standards or beams.”

I will say to you there is no similarity as between that and a pump casing. [781]

Q. Just go on. “— secured to which are interior and exterior walls 4 and 7.” Now, isn’t this casing, 7, which is the part that appears in the model here before us, Defendants’ Exhibit “X”—isn’t that a discharge casing?

A. Yes, but that is not the pump casing.

Q. It is a discharge column, rather?

A. That isn’t what you asked me.

Q. I am getting to the point now of comparison. Layne has got a discharge column, hasn’t he?

A. Yes, every pump has.

Q. Now, this No. 7 is the discharge column, isn’t it?

A. The member 7 in combination with No. 4 provides discharge ways, yes.

Q. And the interior part 4 is a casing interior of the discharge column, isn’t it?

A. The box, 4, inside of the box, 7, leaves discharge ways as shown by the area here marked 3.

Q. There are four of these waterways between the outer casing, 7, and the interior casing, 4, aren’t there, in a column?

A. I think what you mean is that they perform the function of water ducts, so that the water, passing up through, comes up through this space—is that what you mean?

Q. Yes, they carry the water from the impeller to the point of discharge.

(Testimony of W. A. Doble, Sr.)

A. From the impeller to the point of discharge.

Q. Now, except that this structure is square, we have a shaft which would be concentric with the inner casing, 4, and the outer casing, 7, haven't we? I am speaking in general terms, *which* I say the axis is concentric with the inner casing: Is that right? A. Referring to the model—

Q. Just answer my question.

A. Read the question.

The COURT.—He may answer the question referring to the model. Is it concentric in the general sense, or not?

A. Referring to the model, there is the shaft, which is placed [782] centrally in the box, 4, and also equally centrally in the box, 7.

Mr. TOWNSEND.—Q. Now, the specification says, beginning with line 40: "The interior walls, 4, extend upward beyond the exterior walls, 7, as in Figure 1, to prevent the water passing up the conduit 3 from overflowing into the interior of the casing or framing, A." Now, that indicates a water protection to the shaft, doesn't it?

A. You are referring strictly to that, and not in the sense of the Layne patent?

Q. I am just saying, what do these words mean. If it keeps the water out of the shaft, isn't that a protected shaft from the water?

A. In that sense I will say it was protected from the action of the water going into a central chamber.

Q. And in so protecting the shaft, it also protects the bearings which are within the casing, 4, from the water, also, does it not? A. No, it does not.

(Testimony of W. A. Doble, Sr.)

Q. Just take the condition as we see it in the Eisler patent, in this model; the bearings, 19 and 18, are inside the casing, 4, are they not?

A. 19 and 18, yes, that is, within the confines of the four walls.

Q. And if no water can enter the casing 4, obviously it cannot get at anything in the casing 4, and, therefore, it cannot get at the bearings, 18 and 19; isn't that true? A. You are not right.

Q. Wherein am I wrong?

A. The bearing, 19, is materially above the height of the flow of the water being pumped.

Q. The water won't get to it, will it?

A. It is above it, it could not get to it.

Q. Very well. It is inside the confines of this inner casing, 4, too, isn't it?

A. It is at the top end, but it is not the [783] casing, 4, that protects the bearing from the water being pumped.

Q. I am talking about it laying within the confines of the walls of the casing.

A. It does at the top end, yes.

Q. And the bearing, 18; look at that; what will you say as to that, the bearing, 18?

The COURT.—That is 18 on the model?

Mr. TOWNSEND.—On the model. The same number applies to the model and drawings of the patent.

Q. That bearing, 18, is also within the confines and within the enclosure of the casing, 4, is it?

A. Leave out "also"; it is within the confines of the enclosure of the casing, 4.

(Testimony of W. A. Doble, Sr.)

Q. I accept the amendment. Bearing 18, would, therefore, be protected from the water?

A. Not at all.

Q. What is the reason for it?

A. The simple reason that bearing 18 is not protected, there is nothing there, and the water in the pump chamber will pass up through the bearing, 18, and the chamber, 4, will fill with the water up to the height the water is being pumped?

Q. What is your authority in the patent when he says he is keeping out the water from the interior of the casing?

A. From 40 years' experience, I know you cannot do it that way.

Q. Then you disagree with the patentee, do you?

A. The patent shows on its face that the bearing is not protected from that water.

Q. Taking the specifications and the drawings together, does not the patent show in the few lines that I read there, that the water is kept from getting into the interior of the casing, 4?

A. It might say so, but it does not do it.

Q. You disagree with the written words, then?

A. I disagree with the fact.

Q. I am talking about the written words of the patent. [784]

A. You may put it that way. I know from my own experience that the water will go through there. There is no way to keep the water from coming up.

The COURT.—Where is the language that you rely on, Mr. Townsend?

(Testimony of W. A. Doble, Sr.)

Mr. TOWNSEND.—In column 1, page 1, “The interior walls, 4, extend upward—”

The COURT.—What line?

Mr. TOWNSEND.—Line 40: “The interior walls, 4, extend upward beyond the exterior walls, 7, as in Figure 1, to prevent the water passing up the conduit, 3, from overflowing into the interior of the casing or framing, A.”

Q. If that was filled with water, that statement, of course, would be surplusage; it would have no meaning.

A. But that would only protect it from that end. The water I am speaking about comes through the lower end; the water cannot come from the top end, because the orifice of discharge is materially below the top surface.

Q. Can you show anything in that patent which says the water comes in from the lower end?

A. I did not say there was anything in the patent to that effect. I am answering, Mr. Townsend, the points you raise with me, and that speaks about the flow of the water into the top end.

Q. So that no water can pass in from overflowing into the interior of the casing or framing, A?

A. Perfectly, but from the top end; that is what it is limited to.

Q. The patent speaks for itself in regard to that. You find nothing, however, by which there is any disclosure in the patent of means for admitting water at the lower bearing into the interior of the casing, 4, do you? Answer “Yes” or “No,” as to [785] the disclosures in the patent? A. Yes.

(Testimony of W. A. Doble, Sr.)

Q. Where do you find any statement, or one word in the specifications that says anything of that sort?

A. You are referring me to the disclosure; to me the drawing offers a more complete disclosure than the words.

Q. You are relying on your interpretation of that drawing then?     A. Of the drawing.

Q. You are ignoring the specification, are you?

A. No.

Q. I am asking you where you can show me a word in the specification which supports your statement that water can enter that casing from the bottom, and yet they want to keep it out of the top.

A. You asked me for a disclosure, and the drawing is as much a disclosure to me as the words.

Q. I am asking you to point out the description of such a possibility.

The COURT.—Gentlemen, I think we are taking a good deal of time on this.

Mr. TOWNSEND.—I think so.

The COURT.—When it comes to interpreting the words of the patent, perhaps that will have to be done with the assistance of counsel.

Mr TOWNSEND.—I will pass on.

The COURT.—It is barely possible that the language to which you refer means that when the water is lifted to the proper height that it is drained into a diverging trough on the other side, rather than drained into the interior of the pump.

Mr. TOWNSEND.—It would have no function

(Testimony of W. A. Doble, Sr.)

inside, that is perfectly obvious. I was testing out the witness' fairness as an expert on propositions of that sort.

Q. In referring to the Halstead patent in evidence, you took [786] occasion to read from the bottom of Column 1 of page 2, wherein it describes how any water that passes up from the top pump bowl or from the space immediately above the top pump bowl, and the sub-shaft, is shunted off to the port, 28; you have given the Court the impression that that is the sole function of the port, 28. Can you find anything else in the patent referring to the function of those ports, 28, or drain tube, 28?

The COURT.—Does not the patent speak for itself on that? I did not understand the witness to testify that that was the only purpose of those vents or ports, as shown by the patent. I understood him simply to say that that was one of the purposes. Am I right?

A. You are correct, your Honor, because that part of the patent seemed to me to explain more clearly the main functions of these conduits, 28.

Mr. TOWNSEND.—Q. May I ask you to read the part of the column, beginning with line 70, down to line 103, on page 2?

A. "It is of course well known that clear water is an excellent lubricant but the tendency of the shaft to corrode renders its use objectionable when used alone. The use of oil alone is highly objectionable as it contaminates the water to such a degree as to become a nuisance when fed from the top or



(Testimony of W. A. Doble, Sr.)

bottom, and requires a more or less complicated system of pipes when fed directly to each bearing, besides adding considerable to the expense of operating. I obviate these objectionable features by using an oil emulsion as a lubricant as above described, thereby providing a cheap lubricating medium, preventing corrosion of the shaft, not contaminating the water delivered and, on account of the constant flow of water through the bearings, providing an efficient cooling system for said bearings. [787]

"It will be readily seen, of course, that since the conduits are connected to the well proper by channel 27 and auxiliary conduits 28, the water in said conduits will be drained to the level of the water in the well when the pump is in operation, and consequently there will always be a movement of the water into said conduits, down the shaft, through the bearings and out through auxiliary conduits 28. The draining of conduits 8, 8a, etc., in this manner also conduces to economy by obviating the necessity of providing a stuffing-box at the top bearing."

Q. You have pointed out, in connection with Plaintiff's Exhibit 4, the Anderson pump, the function of the drain tube with respect to the entry of water upward around the shaft. I understood you to say that you found the same functions present of these drain tubes taking away any water leakage that came upward around this section surrounding the shaft, into the little chamber, 27, and out 28. I was correct in that, was I not?

A. I was reading from page 2 of the patent.

Q. You found present in this Plaintiff's Exhibit

(Testimony of W. A. Doble, Sr.)

4 the function of the drain tubes with respect to the matter that you first read beginning on page 2 of the Halstead patent, lines 63 to 65? A. Yes.

Q. You found that function present?

A. Yes, I found that the elements as set forth in that part of the patent are in this Plaintiff's Exhibit 4.

Q. Now, referring one word more to the Eisler patent, you criticised the practicability of it, in that it used a system of oiling by means of pipes whereby certain bearings might get more oil than other bearings. Am I right in that?

A. I did not criticise it. I simply pointed out the operation. [788]

Q. You pointed out that that was an objection to this method of lubrication in Eisler by using these pipes, the fact that some bearings would get more than others?

A. A material difference in the system is that that is a series lubrication and this is a parallel lubrication.

Q. I am talking about the Eisler.

A. The Eisler is parallel, whereas the Layne patent—

Q. I am not talking about the Layne patent. I am talking about the criticism that you leveled at the Eisler construction.

The COURT.—He so stated.

Mr. TOWNSEND.—Q. If you have a conduit delivering to different levels, cannot you arrange the delivery of lubricant to the different levels by using pipes of a different diameter?

Mr. LYON.—That is objected to as immaterial; that is not what the plaintiff or defendant do, and it is merely argumentative, and will shed no light on the question of difference between parallel and series lubrication.

The COURT.—I think I shall let him answer, in view of his criticism of that system, or of his suggestion that it was objectionable.

A. Theoretically, you could; practically, you could not; it would not be reliable. We found that out in practice.

Mr. TOWNSEND.—That is all.

Mr. LYON.—No redirect examination.

If your Honor please, the plaintiff has taken in rebuttal the deposition of William Clasmann. I will not take the time, unless counsel insists, or the Court, to read that deposition, if it may be considered as read and before the Court. I will simply state what it shows. It shows that Mr. Clasmann was the chief engineer of the Pabst Brewery at Milwaukee at the time of the installation or attempted installation of the Byron [789] Jackson pump which is supposed to have been a completion of the invention of Byron Jackson, which is pleaded as a prior invention, antedating Mr. Layne; and Mr. Clasmann's deposition was taken to show that, as a matter of fact, what was put in at the Pabst Brewery in the way of alignment and lubrication system was not successful, was taken out and was abandoned at that time, so that it cannot, itself, be a completion of the invention, and they must prove some other completion; the point being that an in-

vention is not complete in the eyes of the law until either an allowable application has been filed in the Patent Office, showing invention—by “allowable” I mean that the necessary papers, in due form have been filed—not allowable in the sense of allowed or not—that being a constructive reduction to practice, a constructively completed invention as of that date; or the inventor must actually build and put an embodiment or machine embodying the invention into actual use sufficiently to demonstrate its success. The deposition of Mr. Clasmann shows that with the construction they had at the Pabst Brewery in Milwaukee in 1904 it was unsuccessful, and that the shaft-enclosing casing was entirely removed; they put in another system of bearings. That is the history of that installation. I call your Honor’s attention to the fact that he produced the drawings of what they substituted for the Byron Jackson attempt, and his deposition shows absolutely that while there is no pretense, according to the Meade deposition and Byron Jackson’s own letters, that there ever was an installation, or, in other words, a reduction to practice of this alleged invention prior to that time, and although Layne’s application was filed on April 28, 1903, they made no attempt to make any other installation than this [790] installation at the Pabst Brewery until the fall of 1904; so that the diligence required by law would be entirely lacking. And the Clasmann deposition shows that the defendant in this case called the witness Clasmann from Milwaukee to Madison, Wis., to testify on their behalf; they in-

terviewed him in a hotel, adjourning the taking of the Meade deposition with my consent, to take Mr. Clansmann's deposition, brought him over, and then said they would go ahead without his deposition, and ran him out of town—I say ran him out of town; they dismissed him and sent him back to Milwaukee, after finding out that his story would not jibe with their theory. They sent him back to Milwaukee and requested him not to communicate with the plaintiff. We subsequently got his deposition as to the actual facts in regard to that installation.

Mr. LOFTUS.—If your Honor please, on that proposition I was present there in Madison. We had stated in our notice we would call this man Clasmann, because we had been informed that he was an engineer for the Pabst Brewing Company, and must have known of the Pabst installation, and must have known of the success of that installation, because the Pabst Company ordered three more of the pumps immediately after the installation of the first one. Therefore, we gave notice we would take the deposition of Mr. Clasmann before we left San Francisco and before we could get back there to Milwaukee and put him on the stand this same representative of the plaintiff corporation, Hermann, or Harmon, had preceded us—

Mr. LYON.—If your Honor please, I did not intend to make an argument.

Mr. LOFTUS.—This is shown in the record.  
[791]

Mr. LYON.—If you want to misstate the testimony, all right.

Mr. LOFTUS.—He had preceded us to Milwaukee, and had interviewed this man Clasmann, so that when we arrived there Clasmann's testimony was not at all in accordance with the facts as previously transmitted to us; necessarily, we could not call him and impeach our own witness. We had to waive his testimony, and rely upon other testimony to show that the Pabst installation was a success; while it is true that on some of these pumps the casing surrounding the shaft was removed, that was because they had to abandon the use of oil after 90 days, because the lubrication that was fed down to those bearings entered the water in the well; that water was used for washing beer kegs, and the mixture of that oil and the water used for washing beer kegs—the oil remained in the kegs and interfered with the Pabst Brewery product; but the pump was operated for 90 days under a 90-day guarantee, was accepted, and was paid for, and thereafter three other pumps were ordered from Byron Jackson Iron Works, of San Francisco. They were installed, as were other pumps in and around Milwaukee.

Mr. LYON.—Clasmann's deposition also shows that while they ordered three more pumps, the order was for the centrifugal portion, not for the shafting or bearings, and that they never were assembled with the shaft-enclosing casing at all; they used open bearings in the well, and did not use anything that they got from Byron Jackson, except the

(Testimony of W. A. Doble, Sr.)

pump proper. When we say pumps, we must not get confused in this case, because the pump proper is the runner and bowls in the centrifugal portion. That is a matter that I called your Honor's attention to in the opening, that this invention did not appertain to an invention, of an improvement in a pump, but it was a [792] power-transmitting mechanism from the top of the earth to the pump, whereby the pump could be kept in operation; that is the part of the invention that Clasmann's deposition shows that they never ordered from Byron Jackson, and the part that the Pabst Company never got. They did get four or five centrifugal pumps. I would like to recall Mr. Doble.

**Testimony of W. A. Doble, for Plaintiff (Recalled in Rebuttal).**

W. A. DOBLE, recalled for the plaintiff in rebuttal.

Mr. LYON.—Q. You have heard the testimony, Mr. Doble, of the witnesses on behalf of the defense in regard to the use of white lead in the joint between the shaft-enclosing tubing and the tapered hub? A. I have.

Q. What is the purpose of the use of such white lead?

Mr. TOWNSEND.—That is objected to on the ground that no proper foundation has been laid in regard to defendant's pump.

Mr. LYON.—Q. You have examined some of these bearings, you have already said?

A. I have.

(Testimony of W. A. Doble, Sr.)

Q. And observed the white lead therein?

A. Yes.

Q. Are you able to state what the purpose of it is? A. I am.

Mr. TOWNSEND.—The same objection. He does not know the purpose for which it was put there.

The COURT.—He may state what effect it has.

Mr. LYON.—Q. What effect or function has such white lead in that connection?

A. White lead, in that connection, performs the function of a packing to make a tight joint.

Q. To what extent is white lead used for that purpose in the mechanical art?

A. In the mechanical art it is used very extensively. I have used it myself for over 40 years. [793]

Q. Can you produce any standard text-books upon the question to show that it is so used?

Mr. TOWNSEND.—There is no controversy, your Honor, that white lead will perform that function under various conditions. Perhaps it performs that function here. It apparently does in some of the pumps. It is immaterial.

The COURT.—If you admit it performs the function here, I will sustain the objection.

Mr. TOWNSEND.—I do not see how we could controvert the fact that that would perform the function of making a tighter joint than it would if it was not put in there. But to say it makes an absolutely tight joint from top to bottom of the well, we do not think so, our tests show that it does not



(Testimony of W. A. Doble, Sr.)

But it makes a tighter joint than it does if you do not put it in. I will admit that. It is a mere matter of degree as to how much tighter it gets.

The COURT.—Mr. Townsend, I understood your witnesses impliedly to deny that it had that function; that they put it in for the purpose, merely, of preventing corrosion or rust of the two parts.

Mr. TOWNSEND.—I believe it was put in, primarily, for the purpose of preventing rust.

The COURT.—I shall permit him to testify unless you admit it does perform that function, that is, that it performs the function of sealing the joints.

Mr. TOWNSEND.—I see no objection to agreeing to that stipulation as an additional function to the matter of preventing corrosion.

Mr. LYON.—With regard to the bell coupling joint that is made by the tapered hub and the end of the tube, what have [794] you to say as to that insuring a tight closure?

Mr. TOWNSEND.—They are referring to a flared end of a coupling that results from being pushed down onto the hub. We have told you how they are made, and I think there again that we are willing to stipulate that the more bearing surface you have between two parts, under certain conditions, you have a tighter joint.

Mr. LYON.—We want to prove by the witness that the pressure of this tube in the manner that has been testified to by himself and his son, by means of the screwing of the couplings together and the pressing of the tube on to this tapered hub, is

(Testimony of W. A. Doble, Sr.)

one of the best known, tightest joints that are used in mechanics; that is the purpose of it; and we are following up the testimony of Wm. A. Doble, Jr., and the stipulated testimony of this witness to show that it is commonly used, in fact is used where the greatest pressures are to be expected; and I expect to show by this witness that if it is desired to take care of gasoline and other very light products, as well as very dry steam under high pressure, such bell joints, as they are called, are used, and that they are known to give the tightest kind of a joint.

The COURT.—Unless there is an admission on the part of the defendant, I shall permit you to go into it.

A. I have very carefully observed the joints of these pumps that were withdrawn, and the tapered structure or construction of that hub, with a tube parallel and forced over the tapered hub will make the most perfect joint, using "perfect" in a relative sense, that is known in mechanics. And in regular mechanics, on a diameter of approximately 3 inches, from 2 to 3 inches, to secure force fits, which are put [795] together under hydraulic stress, an expansion of from 3/1000ths to 6/1000ths of an inch is allowed; and from the measurements on these hubs, I find that the tube is expanded to approximately 24/1000ths or 26/1000ths of an inch, and that forces the tube to conform to the tapered structure of the hub, and makes the most perfect closure against leakage that can be produced mechanically; and, due to that forcing action, the inner surface of the tube is burnished and brought

(Testimony of W. A. Doble, Sr.)

down to a perfect surface, as shown by the tube removed; and throughout all the high-pressure work which I have done, we have used, for the highest pressure work, a tapered joint; it is the common practice of the American Society of Auto-Motive Engineers for all joints, as is shown clearly in the standard forms of the Society of Auto-Motive Engineers; and, furthermore, I have used it for steam pressures as high as 1500 pounds per square inch, with super-heated steam having a temperature of from 800 to 900, or 1,000 degrees, so that the steam was a red-hot gas; but it is the only form of joint which we could develop that would make an absolutely tight joint under those circumstances. The amount of expansion which is allowed there in forcing that tube over the tapered hub, and in combination with the white lead, makes a perfect mechanical closure.

Q. I notice, in giving your last answer, you have referred to two works. What were they?

A. I am looking at page 821 of the Automobile Trade Directory, April, 1918, in which are published the patents and standards of the Society of Auto-Motive Engineers. I was also referring to a machinery hand-book, which is a standard hand-book on mechanical subjects, pages 879 to 890, which referred particularly to the effect [796] of pressed fits, and the amount allowed for pressed fits. I also have the same information from different authorities in the American Machinist Hand-book of Caldron & Stanley.

Q. I show you a device which I hand you disas-

(Testimony of W. A. Doble, Sr.)

sembled. Do you know what it is? A. Yes.

Q. What is it?

A. This is a tapered joint which we use for high-pressure steam work, and which we have used as shown here for pressures as high as 1500 pounds per square inch, and with red-hot steam, and is absolutely tight.

Q. How does that compare with the joints that we have been discussing in this defendant's Western Well Works pump at the ends of the shaft-enclosing tube?

Mr. TOWNSEND.—That is objected to as no proper foundation has been laid, and only applying his general information to the specific action of the pump under operative conditions.

The COURT.—Overruled.

A. In the defendant's construction, and in the joint which I hold in my hand, there is a flared tube forced on to the conical hub. In this structure it is a double-ended connector, and so the double hub is made in one ring.

Mr. TOWNSEND.—We ask that that be stricken out, as there is nothing to show that the defendant used a flared tube that fits over the conical hub. It fits over a cylindrical tube, which, under pressure, has been known to expand. This is a very different thing.

The COURT.—Denied.

A. (Continuing.) With double faces or with conical ends the same as the conical ends in the defendant's structure, differing only in degree. In

(Testimony of W. A. Doble, Sr.)

the defendant's structure, the tube is forced over the conical projecting hub, and is belled or [797] expanded so that it makes a perfect fit between the conical hub and the expanded bell of the tube; and in the tubes which I removed, we could measure the permanent set of this bell. Now, we have two belled tubes drawn together over this conical hub. In the structure which I have in my hand the bell-ing is more abrupt than that used by the defendant.

Mr. WHITE.—We offer in evidence this joint construction, and ask that it be marked "Plaintiff's Exhibit 19."

Mr. TOWNSEND.—Objected to as immaterial, irrelevant and incompetent.

The COURT.—Overruled.

Mr. LYON.—You may take the witness.

Cross-examination.

Mr. TOWNSEND.—Q. Are there any additional functions occurring to your mind, Mr. Doble, as to the use of a conical hub in the defendant's combination coupling other than to form a tight joint?

Mr. WHITE.—I object to that as immaterial.

The COURT.—Overruled.

A. No. The only purpose of that construction is to make a water-tight joint in a structure of that kind in which it would make the most perfect water-tight joint that could be constructed.

Q. Does it not occur to you that the taper of that character, the tapering hub, would assist in centering the tube section when it is lowered, so that it will go over a hub that is tapered more readily than

(Testimony of W. A. Doble, Sr.)

it would go over a hub that was perfectly cylindrical?

A. Well, if the function of the hub and the function of the tube was to make a tight joint, that would be quite true; but if you did not want a tight joint, then the tube would slip over just as readily as it slips over [798] the small end of this. The only function of the taper on this is to make an absolutely water-tight joint.

Mr. TOWNSEND.—I move that the latter part of the answer be stricken out, as the only pertinent part is where he said it would assist in centering a tube section.

Q. That does form and would form a centering device with a tube which is of larger diameter and of smaller outer tapering end, would it not?

A. Yes, if your tube is larger than your hub it is going to be easy to put the tube over the hub.

Q. Larger than the outer end of the hub—

Mr. LYON.—We do not contest that the small end of that hub would serve to help center that.

Mr. TOWNSEND.—My question is as to the big end of the hub.

Q. Would not the use of a tapered hub also assist, as has been testified, by the witnesses, in compensating for tubes varying slightly in length one from the other?

A. Surely, it would enable you to make an absolutely water-tight joint.

Mr. TOWNSEND.—I move that the latter part

(Testimony of W. A. Doble, Sr.)

of the answer following the answer "surely" be stricken out.

The WITNESS.—Not a bit of it; that is part of my answer. It is part of the answer, because unless you had the taper on there you could not have a water-tight joint, with a variable length of tube.

Q. I am not talking of water-tight joint now. I am talking of compensating for variations in length of tube. That could be a function of the tapered hub?

A. No, because you could have a parallel tube and that would drop over it, unless you wished to secure an absolutely water-tight joint; that is the only function of the taper, because otherwise you could make your whole hub parallel and the tube would slip over the [799] entire length, and that would take care of the difference in length of the tube as well, but the function that you ask me about, of the taper, is to make an absolutely water-tight joint and nothing else.

Q. You have testified in addition to that latter part one function is centering. You are willing to say that in combination with a tighter, or a water-tight or otherwise joint, by tapering the hubs you can compensate for variations in length of the tube section: Is that correct?

A. No, you are misstating me entirely. In the first place, I have said that the taper feature has absolutely no effect whatsoever, either as centering or as compensating for length. The only possible function that can be performed by the taper is to

(Testimony of W. A. Doble, Sr.)

make a tight joint, because if the double hub was parallel and of the size of the small end, then your tube would center on it just as readily, and it would allow for the variation in the length of your tube, so that by deduction the only function left of the taper is to insure, under those conditions, an absolutely water-tight joint. That is the mechanics of it.

Q. You have never installed any of these, have you?    A. I have made a lot of them.

Q. I say, you have never installed any of these defendant's pumps?    A. No.

Q. Now, taking a tube that has a tight fit, as you say, what is the effect, if you know, of the vibration resulting from a rapidly-rotating pump shaft on the gradual increase in diameter of that end of the tube section where it slips over the hub?

A. With the tube forced tight over the hub there would be no deterioration; I presume that is what you are interested in, of that fit, or it would not wear that [800] structure large, unless the vibration were of such magnitude as to disturb the entire structure and set by deflection.

Q. There is a tendency of a suspended shaft driven from one end to vibrate, is there not?

A. Not necessarily so. There is a law of the critical speed of shafts, which, to prevent a bowing action of the shaft rotating, the distance between the bearings must not be longer than or greater than a certain amount, based upon the speed and the diameter of the shaft.



(Testimony of W. A. Doble, Sr.)

Q. Do you know what vibratory action takes place in pumps of this character with regard to the shaft when in rotation? A. Yes.

Q. What is it?

A. The impeller may not be balanced originally, it may not be a dynamic balance.

Q. That will cause vibration throughout the shaft lengths?

A. That would cause vibration at the lower end.

Q. The vibration will be transmitted to the several bearings?

A. No; it will be transmitted through the entire structure.

Q. And that would tend to cause these parts that have fractional contact to have a slight movement one on the other? That is perfectly obvious, isn't it?

Q. You mean with reference to the tube and the hub?

Q. Yes. A. Not necessarily so.

Q. It might do it? There is nothing there to hold them rigid?

A. Oh, yes, there is; that is the most rigid structure there, in that they are held absolutely under a very heavy compression between the two combination couplings.

Q. In the one that you saw, which was the top section of the pump head—that is what you are basing your experience on, isn't it? A. No.

Q. In the defendant's pump structure what you

(Testimony of W. A. Doble, Sr.)

saw there [801] Monday, where that was held very tight?     A. No.

Q. Plus, perhaps, Plaintiff's Exhibit "4," the Anderson pump, in its inert condition?     A. No.

Q. Have you seen any other of the defendant's pumps taken apart?     A. Yes.

Q. Have you had opportunity to observe the defendant's pumps under operative conditions?

A. I could not say just where or when, but having been in the pump business a great many years, I know I have seen them, but I could not say just where or just when.

Q. You have not seen any instance, within your recollection, a pump of defendant's in operation so you would have an opportunity to observe what the shaft action would be at different points in the line of the column between the pump-bowls and the pump-head, have you?

A. No, I never went down a bored well while the pump was running.

#### Redirect Examination.

Mr. LYON.—Q. Mr. Doble, you have been asked a good many questions about the taper on these hub bearings, and the couplings of the defendant's pumps. Based upon your experience in the manufacture, and I understood you said you were the chief engineer of the Pelton Water Wheel Co. of San Francisco, and manufactured some of these same pumps?     A. I am.

Q. Based upon that experience, are you able to

(Testimony of W. A. Doble, Sr.)

state which, comparatively, is the cheaper to manufacture, such a hub straight or with a taper?

A. It adds to the cost when you depart from an ordinary cylindrical construction, as it requires a greater degree of accuracy in measuring. In these different hubs I find accuracy extremely *extremely* good and uniform, and it costs more to do that kind of work than [802] to do plain, cylindrical work.

Mr. LYON.—That is all.

Mr. TOWNSEND.—That is all.

**Testimony of O. P. Woodburn, for Plaintiff (In Rebuttal).**

O. P. WOODBURN, called for the plaintiff in-rebuttal, sworn.

Mr. LYON.—Q. Please state your name, age, residence and occupation, Mr. Woodburn.

A. O. P. Woodburn; 50 years of age; residence, Houston, Texas. My profession is a mechanical engineer.

Q. Are you acquainted with Mr. Mahlon E. Layne, who sits back of me here? A. Yes.

Q. How long have you known Mr. Layne?

A. I think about since 1896 and 1897.

Q. Were you ever at any time associated with him in business in Texas? A. Yes.

Q. In what business?

A. In the manufacture of well supplies, and also in the installing of pumps in wells.

Q. You were acquainted with Mr. Layne before he

(Testimony of O. P. Woodburn.)

went to Texas, were you?   A. Yes.

Q. Do you know what year it was he went to Texas?   A. In January, 1902.

Q. You worked with or for Mr. Layne on a Milner ranch in Texas?   A. Yes.

Q. Where was that?

A. That was at Pierce, Texas, I started to work there in about April 22d, or thereabouts.

Q. How are you able to fix that date?

A. From a memorandum-book that I had of that year.

Q. Is that memorandum-book still in your possession?   A. No.

Q. Where is it? Is it in the files of the United States District [803] Court at Los Angeles?

A. I suppose it is; yes. It was left there.

Q. It was offered in evidence when you gave your testimony before the Special Master in the case of Layne & Bowler Corporation v. The American Well & Prospecting Company trial?   A. Yes.

Q. What work was it that you and Mr. Layne were doing in April, 1902, upon said Milner ranch?

A. We were attempting to install a pump, what is known as an old-style vertical pump, in pits that had to be dug by hand, to a depth at which the pump would secure the desired quantity of water.

Q. Did you ever at any time have any conversations with Mr. M. E. Layne in regard to any scheme or thought of his in regard to pump installation or pumps?

A. Yes; a few days after starting the work at

(Testimony of O. P. Woodburn.)

Pierce we encountered trouble in excavating, and at that time he mentioned to me that he could make a pump that could be put down in a small-sized bore or pit that would answer the purpose of the type of pump we were then installing.

Q. Please go ahead and tell us what it was that he explained to you at that time, and how he proceeded. Who was present?

A. I talked to him from time to time, but the special time that I can remember is when a party by the name of Tewksbury was present, and also Mr. E. A. Milner. This was out near the well of which we were trying to dig the pit, by the side of a barn or boiler-house that was there, and Mr. Layne described his ideas, illustrating it with some pencil-marks on the side of the building while we were talking.

Q. Describe those pencil-marks, and what Mr. Layne said at that time, and what conversation you had with him at that time, [804] which you remember; give us the substance.

A. I cannot tell the exact words, but the substance was to the effect that Mr. Layne's ideas of making the pump were to have the pump suspended from the surface of the ground down to such a depth as was necessary, supporting the pump by a line of tubing which ran through the pump impeller inside of this line of tubing; he would have a line of shafting to operate the pump, with bearings at various intervals, and this tubing would support the pump, keep the shafting and

(Testimony of O. P. Woodburn.)

bearings in line, and provide a means to furnish a lubricant to the bearings along the shaft line. The arrangement of the pump in the pit was discussed, but as that was a minor detail and was only a matter of construction, that was not impressed upon my mind at that time.

Q. Did you have any connection, in a business way, with Mr. Layne in the year 1903 at the Scotvold & Linner well?

Mr. TOWNSEND.—Objected to as immaterial and leading.

Mr. LYON.—It is preliminary.

The COURT.—He may answer. A. Yes.

Mr. LYON.—Approximately when was that?

A. It was, as I remember it, in the late summer or early fall—late summer, I think about the close of the pump season.

Q. Of 1903? A. Yes.

Q. When you say late summer, do you mean the latter part of August or forepart of September?

A. Probably earlier than that.

Q. I ask you that question because the term "summer" in California is a very indefinite thing. What do you mean by it in your answer?

A. I mean at the close or near the close of the pumping season for rice irrigation, which is along about August. [805]

Q. What kind of a pump were you working on with him at that time? A. It was a turbine pump.

Q. What were you doing with it?

(Testimony of O. P. Woodburn.)

A. It was installed over at the Scotvold & Linner well to determine whether it would operate successfully.

Q. How was that pump installed? Could you describe it?

Mr. TOWNSEND.—This is referring, on rebuttal to occurrences subsequent to the date of application of the Layne patent in suit, and immaterial.

Mr. LYON.—But prior to any installation by the Byron Jackson Company of an alleged invention of Byron Jackson.

Mr. TOWNSEND.—The defendant is not seeking to prove prior use; we are seeking to prove prior invention and an inventive act contemporaneous with the conception, and this was all subsequent not only to that, but to the date of application of the Layne patent in suit. It is immaterial, and it is not rebuttal.

The COURT.—How would it be material if it is after the date of the Layne application?

Mr. LYON.—Not unless there is some contention here that Mr. Layne, because of his application for a patent, has not reduced the invention to practice. On my own theory of this case, your Honor, the Layne application is a constructive reduction to practice, and we need to show nothing further. Counsel's objection would foreclose him from hereafter arguing that anything further is required, and if he insists upon the objection I will not insist upon the answer.

Mr. TOWNSEND.—The filing of an application

(Testimony of O. P. Woodburn.)

is such a constructive reduction to practice, as counsel says, but what he does later is only in the nature of cumulative matter. It would be [806] utterly immaterial.

The COURT.—Counsel insists on it?

Mr. LYON.—You may take the witness.

Cross-examination.

Mr. TOWNSEND.—Q. During the years since 1902, Mr. Woodburn, where have you been, in what line of work and where?

A. I have been engaged nearly all the time in Houston, Texas, in the manufacture of water well supplies.

Q. Have you been, during all of those years, connected with Mr. Layne, with the president of the plaintiff?

A. Nearly all those years. There was 1907, I believe I was not connected with him, and since 1918 I have not been connected with him.

Q. But, otherwise, you have been continuously associated with him? A. Yes.

Q. When did you last testify with regard to the matters that you have just referred to?

A. In Los Angeles, in the spring.

Q. In the American Well Prospecting case?

A. Yes.

Q. In which the present plaintiff was plaintiff there? A. Yes.

Q. Involving this same patent in suit?

A. Yes.

Q. I believe the record there shows that you care-



(Testimony of O. P. Woodburn.)

fully reviewed the testimony that you were to give before giving it there?

Mr. LYON.—We object to that statement.

The COURT.—Sustained.

Mr. TOWNSEND.—Q. How recently have you discussed the matter of this alleged early disclosure, Mr. Woodburn, with Mr. Layne or any of the parties connected with the plaintiff in suit?

A. I believe it has been mentioned once or twice since I have been here this time. [807]

Q. Since you have been here in San Francisco?

A. Yes.

Q. Have you had occasion previously to testify in this same matter—previous to the American Well Prospecting case, the Los Angeles suit?

A. I gave testimony in some prior suits, but at that time I did not know that I had this memorandum-book, and could not remember the date without the memorandum-book, that I discovered in my papers after moving from Memphis to Houston; I was cleaning out and ran across this memorandum-book.

Q. The memorandum-book is a comparatively recent discovery, isn't it, Mr. Woodburn?

A. No, I have memorandum-books for nearly every year since 1902.

Q. But this one is a comparatively recent discovery?

A. It was discovered after my return from Memphis in 1918.

Q. Then you discovered it since 1918?

(Testimony of O. P. Woodburn.)

A. During 1918.

Q. Who made the drawing on the building that you referred to? A. Mr. Layne.

Q. What did he make that drawing with?

A. It might have been a pencil, or it might have been a nail, I do not remember at the present time, but I remember the outlines that were marked on the rough boards of the building.

Q. You say it might have been a nail?

A. It might have been. If I had a pencil in my pocket, though, he would have borrowed it from me and made it with the pencil, because he never had a pencil of his own.

Q. Did that nail or pencil drawing show a stuffing-box?

A. It did not go into details of the work. It just gave an outline of how the pump would be suspended on the surface of the ground, with the enclosing-shaft casing, and the shaft running inside to operate the pump.

Q. Did it show any bearings?

A. I don't think it did; it [808] just showed the outline of the pump.

Q. Did it show the shaft in sections?

A. I don't think it did.

Q. You don't believe it showed the lower stuffing-box?

A. I don't think it did, because all that part was oral description given by Mr. Layne, as he outlined it.

Q. Did it show the top stuffing-box?

(Testimony of O. P. Woodburn.)

A. I think not.

Q. Did it show the lubricating means?

A. That was the description also.

Q. That was entirely oral?     A. Yes.

Q. Did that show a discharge pipe, that nail or pencil drawing, that you speak of?

A. I believe it did, but I am not sure in regard to that.

Q. Was that discharge pipe concentric or eccentric to the shaft?     A. Eccentric.

Q. Do you recall any other features that the nail or pencil drawing showed?     A. No.

Mr. TOWNSEND.—That is all.

Redirect Examination.

Mr. LYON.—Q. Have you a clear recollection, Mr. Woodburn, as to which parts were in sketch form on the side of the building and which were oral?

A. The parts that I am sure were in sketch form were the important ones. That is all that we were considering at that time, the important parts, were in sketch form—that is the outline of the parts.

Q. What was the object of making the sketch at that time, do you know?

A. To show how that pump could be made, or could be put into a pit, that would not require so much expense and work to install, and which could be put down to a greater depth than was possible with the means that we were then employing.  
[809]

(Testimony of O. P. Woodburn.)

Q. What was the occasion of making it on the side of the building?

A. Because we were out of the building and there was no convenience for making a drawing or anything at hand.

Q. The purpose was so that Mr. Tewksbury and Mr. Milner and yourself would understand what he had in mind: Was that it?   A. Yes.

Mr. TOWNSEND.—Objected to as leading.

The COURT.—That is quite leading.

Mr. LYON.—That was very grossly leading, but I wanted to know what it was. I don't think it is objectionable after all the testimony. That is all.

Mr. Townsend, you have a copy of Mr. Layne's testimony in the so-called Los Angeles case; you have heard Mr. Woodburn's testimony. Do you want us to take the time to examine Mr. Layne in regard to the subject matter that Mr. Woodburn has just testified to, or will you stipulate if called he would testify to substantially the same facts?

Mr. TOWNSEND.—With this addition, if I may ask the witness a question or two on cross-examination in regard to certain parts of the testimony.

Mr. LYON.—You can. In other words, it is stipulated he will testify substantially as Mr. Woodburn has, and you may cross-examine him.

**Testimony of M. E. Layne, for Plaintiff (In Rebuttal—Cross-examination).**

M. E. LAYNE, recalled for the plaintiff in rebuttal.

**Cross-examination.**

Mr. TOWNSEND.—Mr. Layne, in the so-called Los Angeles suit of your company, the present plaintiff, against the American Well & Prospecting Company, on the same patent, do [810] you recall your testimony in connection with the letter which Mr. D. W. Mead, one of the plaintiff's witnesses, in this case, wrote to the Layne & Bowler Company, at Los Angeles, California, November 7, 1911, on the letter-head of Daniel W. Mead, Consulting Engineer, Madison, Wisconsin:

"Replying to your favor of October 13th, in regard to enclosed line shaft centrifugal pumps, I would say that the first construction of this sort with which I am acquainted was furnished one of my clients—the Pabst Brewing Company, of Milwaukee, for some deep well pumps built by the Byron Jackson Machine Co., San Francisco, California, about 1901. The proposition and a sketch of the proposed arrangement was furnished me early in that year, the exact date of which I am unable to give you. I trust, however, the above will give you the information you desire.

Yours very truly,

(Signed) D. W. MEAD."

This letter appearing in the transcript of the Los Angeles suit at page 991, and I will ask you at

(Testimony of M. E. Layne.)

the same time if you recall—

Mr. LYON.—I will tell you, Mr. Townsend, I will, of you want to stipulate, stipulate that the official reporter may copy the whole of Mr. Layne's testimony in that Los Angeles case into the record, and it may serve as your cross-examination, if you want it.

Mr. TOWNSEND.—No, I just want this one question in regard to the matter.

A. That letter, as I remember it, was written in answer to a letter that Mr. Bowler had written Mr. Mead, with which I had nothing to do; but the letter that you have just read, I am quite sure, is correct. That is, it was received from Mr. [811] Mead, but I had nothing to do with it. I don't know any of the particulars; I neither received the letter nor dictated the letter to which that was a reply, and I knew nothing of the other letter for some little time; that is the best of my recollection; I might have been informed of it right at that time, but at the present time I don't know that I was.

Q. On page 998 of the same Los Angeles record appears a copy of a letter from Mr. Bowler to you, dated November 13, 1911:

“M. E. Layne, Esq.,

“Houston, Texas.

“Friend Layne: Referring to the copy of following letter, it occurs to me that I had better let you get hold of this fellow and not correspond further with him. He is an old man, having such evidence as this, which I am sure the Byron Jackson Com-

(Testimony of M. E. Layne.)

pany have in their possession, it is hard for me to get the right kind of a deal out of them. If you cannot attend to it at once, let me know and I will endeavor to get him straightened out and agree that it was in the same year the drawing was made and sent to me, that the sketch was made, etc."

Do you recall that letter?

A. I recall getting the letter; yes.

Q. That letter refers to the one I have just read in regard to Mr. Mead?

A. I think so, but I am not positive of that.

Mr. TOWNSEND.—That is all.

Mr. LYON.—Mr. Layne, one other question: I show you a letter on the letter-head of the Byron Jackson Machine Works to the Peden Iron & Steel Co.—this is the so-called Peden Iron & Steel Co. correspondence in the Los Angeles case, of which you have copies, Mr. Townsend—I simply wish to offer this in evidence in this case and to supply a copy to-morrow of the one exhibit which will be here, certified, from Los Angeles; on account of the holiday the photographing was [812] delayed.

Mr. TOWNSEND.—I suggest that those letters be read in evidence, as part of the record.

Mr. LYON.—Do you want me to take the time to read them?

Mr. TOWNSEND.—No, let them be copied into the record.

Mr. LYON.—This is correspondence had at that time, Mr. Layne, between the Byron Jackson Machine Works and the Peden Iron and Steel Co.?

A. Yes.

Mr. LYON.—In one of these letters there is referred to a blue-print, 1-B-89, of the Byron Jackson Machine Works. There is no need, Mr. Townsend, of duplicating that; it is already in evidence; you have offered it in your behalf, and the only thing we reserve is the production here to-morrow, or as soon as it arrives from Los Angeles, of the photographic certified copy of the other sketch which is referred to in these letters, and with that the plaintiff closes its case.

The COURT.—You do not offer these in evidence?

Mr. LYON.—I am offering these in evidence; they may be copied into the record and returned to us.

(The letters are as follows:)

(Letter-head of Byron Jackson Machine Works.)

“San Francisco, Cal. Dec. 2, 1902.

“Peden Iron & Steel Co.,

“Houston, Tex.

“Dear Sirs:

“We are in receipt of yours dated Nov. 28th and note that the prices quoted you on our centrifugal pumps are too high for general service. If you have any propositions for high head pumps, kindly send us specifications. We are fast replacing steam direct acting pumps with centrifugal pumps for high heads. We are now manufacturing centrifugal pumps for Schenectady, N. Y. to raise water 520 ft. We have two orders [813] in the works now for 6" centrifugal pumps to raise water 250 ft.

“Respectfully,

“BYRON JACKSON MACHINE WORKS.

“Per BOYER.”



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(Bearing rubber stamp: "Peden & Co., Received Dec. 8, 1902.")

"Jan. 23-03 16-Sa.

"Byron Mfg. Co.,

"San Francisco, Cal.

"Gentlemen:

Please give us price by return mail and state how soon you can make shipment of same, on 3-pumps 36" 36 foot lift, and 3-pumps 36" 16 ft. lift. Also please give us prices on 24" pump.

"Yours very truly,"

(Bearing rubber stamp: "File Copy must not be held out of Files." and also "Return to — E. A. PEDEN.")

"March 7th, 1903-24-JFB.

"Byron Jackson Mach. Works,

"#625-631 Sixth St.,

"San Francisco, Cal.

"Gentlemen:

"We are in position to make a sale of some pumps, provided we can get a pump that would meet the requirements, i. e.—we wish a pump that would discharge from 1,000 to 2,000 gallons of water per minute on a lift of 50' to 60'. We also want a pump that can be placed in as small a hole as possible, say 30" to 40" in dia.

"We herewith enclose a sketch showing, in our opinion, what might be possible in the way of designing a top discharge for a centrifugal pump. In this sketch you will notice that we have an under suction and a top discharge; the propellor discharges into an opening directly over same and convey to one side

of the shaft to discharge pipe in place of followingg around the pump [814] and discharging in the usual manner, on the side.

"If this discharge can be arranged it will lessen the size of the hole pump must be placed in.

"If you can design a pump with as great efficiency in this way; even though the end thrust on the end would be greater than in the top suction, we could overcome this by using ball-bearings on shaft.

"In your judgment would we need further stay the pump in the pit other than by being braced to the shaft and post suspending the pump.

"To make a long story short. We wish you to submit us a plan or cut-off pump that you would recommend for this work. We herewith enclose pencil sketch as we believe it possible to design a pump on this plan. This discharge is simply the same as your compound discharge would be from one into another. If you can furnish this pump, could you make immediate shipment and at what price? Would you recommend compound pump?

"Yours truly,"

(Bearing rubber stamp: "File Copy must not be held out of Files," and "Return to — E. A. PEDEN.")

(Letter-head of Byron Jackson Machine Works.)

"San Francisco, Cal., Mar. 13, 1903.

"Mess. Peden Iron & Steel Co.,

"Houston, Texas.

"Gentlemen:—

"Replying to your valued inquiry, by Mr. P. D.

*vs. Layne & Bowler Corporation.* 875

Bowler, referring to a Centrifugal pump to lift 1000 to 2000 gallons of water per minute, 50 to 60 ft., same to be placed in a hole, say 3 ft. to 4 ft. in diameter.

"We hand you herewith our blue-print 1-B-89 showing 8" vertical Centrifugal pump with 18" runner, of capacity of [815] 1600 gallons per minute, for a total head of 60 ft., when making about 825 rev. per minute. The weight of the shafting on this pump will be partly balanced by our automatic device, but not entirely so. It is therefore necessary that you provide a step bearing on the extension shaft of this pump to take up the total weight.

"The efficiency of this pump will be practically as high as any of the regular type that we manufacture. Price, \$200.00 f. o. b. cars San Francisco. Approximate weight 1500 pounds. We could furnish the same in 15 days after receipt of order.

"This pump will not require any further staying than bracing to the shaft and posts suspending the pump.

"Hoping to be favored with your valued order, we are,

"Yours very truly,

"BYRON JACKSON MACHINE WORKS,

"Per PAULSMEIER."

(Bearing rubber stamp: "Peden & Co. Received Mar. 17, 1903. Ansd.—" And "Quotation.")

"Mar. 17-03 17-Sa.

"Byron Jackson Machine Works,

"San Francisco, Calif.

"Gentlemen:

"Yours of the 13th at hand and contents noted. You have evidently misunderstood our letter. We do not wish a side discharge pump which your blue-print shows. You have evidently overlooked the part of our letter where we ask whether you could furnish us a pump with a top discharge similar to the series Compound pump you build, i. e. with a runner to discharge direct over or on top of same in place of at one side as per your blue-print.

"In this way the pump could be put down in a much smaller well than you have outlined, namely 3 or 4 ft. We wish to use [816] this pump in a smaller hole than four feet, in fact we do not care to go over 30 or 36" at the outside.

"Please let us hear from you regarding this matter."

(Bearing stamp: "File Copy must not be held out of Files.")

(Letter-head Byron Jackson Machine Works.)

"San Francisco, Cal., April 2, '03.

"Peden Iron & Steel Co.,

"Houston, Texas.

"Gentlemen:

"Replying to your valued favor of March 17th which we have not answered immediately because we wished to have a drawing made at our draughting-room to lay the matter out properly before quoting you.

"We hand you herewith sketch showing an 8" vertical pump with 18" runner which we think will just fill your requirements. You will notice that we have split the discharge end in two. We did this in order to hang the pump centrally, so it will not require any further bracing which would be absolutely necessary if the discharge were on one side as the weight is then not equally distributed. The pump as we have shown it is intended to be lowered into a pit and it can be hung on the two pipes. You would have to provide a bearing just above the pump fastening on both ends to the 6" pipe, or if you prefer, we would cast brackets on the pump body for the purpose of bolting on wooden posts the same as it is done with our regular pumps. The price on this pump would be \$250.00 for the first pump as we would have to make special patterns to suit this condition, but if you should have several pumps of this size, we would make them for the same price as quoted you in our last letter which is—\$200.00. We also hand you a small blue-print which we made about a year ago showing a small pump designed for the purpose of slipping [817] it into a round well. You will notice that the bearing above the pump is fastened to the pipe, the same as we advised you to do it above.

"We think that this will make a very good job and ought to bring a good deal of business. We can furnish you with one of these pumps in a very short time, say two to three weeks.

"Hoping to be favored with your valued order, we remain,

Very truly yours,

"BYRON JACKSON MACHINE WKS.

"Per PAULSMEIER."

(Bearing stamp: "Peden & Co. Received Apr. 7, 1903. Ansd. 4-8-3 #3." "Copy to Layne.")

"Apr. 8-03 3-Sa.

"Byron Jackson Mach. Works,

"San Francisco, Calif.

"Gentlemen:

"Replying to your favor of the 2nd inst. would say that the writer is leaving the city today to be gone for some time and as soon as he returns will go into the matter and let you hear further from us. Please accept our thanks for your attention relative to this matter.

"Yours very truly,"

(Bearing stamp: "File Copy must not be held out of Files." and "Return to — E. A. Peden.")

Mr. TOWNSEND.—May I ask to recall Professor Lesley for one question in surrebuttal?

**Testimony of E. P. Lesley, for Defendants (Recalled in Surrebuttal).**

E. P. LESLEY, recalled for defendant in surrebuttal.

Mr. TOWNSEND.—Q. Professor, you heard Mr. Doble, Sr.'s testimony with regard to the action of a rotating shaft on a spiral groove of the defendant's combination coupling, and its [818] propulsion of a pump bearing but slowly; have you made any

(Testimony of E. P. Lesley.)

tests with regard to what the action is with respect to the defendant's bearing?

Mr. LYON.—We object to that on the ground it is a part of the case in chief, and they testified fully in regard to it.

The COURT.—Possibly so, but it was gone into by you, and he may answer.

A. Yes, I have made such tests.

Mr. TOWNSEND.—Please explain the result of those tests and what you arrived at.

A. Under my directions we constructed a bearing structure involving a single bearing, provided within a thousandth of an inch—within such dimensions as are possible with reamers—with the same diameter as the standard bearing for a  $1\frac{1}{4}$  shaft.

Q. Provided with the same pitch of helical groove?

A. Provided with the same pitch of helical groove, and same diameter of shaft supplied, and support for the bearing, so that there would be no thrust upon one side, so that it would be simply hanging vertically within the bearing, and arranged to rotate it at various speeds. We determined, first of all, the pump action of the spiral bearing. Mr. Doble, by the way, is entirely correct, that it should be called a helical groove; I have simply adopted the term "spiral," because that is the term the Western Well Works have used. The action of this helical groove is to conduct lubricant downward, since the groove is downward in the direction of rotation—conducting it downward with considerable rapidity and with astonishing force. I used a

(Testimony of E. P. Lesley.)

number of lubricants. I used water alone. Water would be conducted downward with the ordinary speed of rotation of about 1100 revolutions per minute, with approximately a [819] pound pressure per square inch—would maintain a pound pressure per square inch. A mixture of water and emulsifying oil would be conducted downward with greater pressure, maintaining a higher column of lubricant. The pressure developed, the downward pressure developed by the lubricant itself passing through that helical groove, appeared dependent upon the quantity of oil, upon the viscosity of the fluid. With the pure lubricant, itself, the pure oil, itself, it developed pressure of 60 pounds per square inch, with a single bearing operated at normal speed, normal clearance of the bearing, and a normal size oil groove.

Q. What would be the result of a series of bearings at different stages along the same shaft? Would that have any difference in regard to the action on the fluid contained in the tube?

A. If the tube were full, of course a series of bearings would act as a multi-stage pump, one bearing would develop some pressure, on the next one further pressure, and so on.

Mr. TOWNSEND.—That is all.

Cross-examination.

Mr. LYON.—Q. Your tests, then, were with water? A. Yes.

Q. With water and emulsifying oil? A. Yes.

Q. And with emulsifying oil?



(Testimony of E. P. Lesley.)

A. Yes, and other things.

Q. What else? A. Graphite grease.

Q. How much graphite grease?

A. Enough to fill the top of the bearing so that it would feed down through.

Q. What did you have to hold the grease above the bearings in that case?

A. I provided a collar.

Q. Made a cup?

A. A collar around the top of the bearing substantially the same as this recess right here.

Q. Any pressure on top of that, on the grease that was in that cup? A. Absolutely none. [820]

Q. And the bearing was stationary that had this grease in it? A. The bearing stationary?

Q. Yes. A. Entirely.

Q. From your knowledge of the Western Well Works pumps, how much grease or lubricant could be contained in one of the lengths of tube, shaft-enclosing tube, with a shaft and containing the tube couplings or bearings? Approximately how much grease?

A. Without stopping to make an estimate I should guess four or five pounds, perhaps ten.

Q. Now, Professor, I understood you to say that the greater the viscosity of the grease the harder it shot through the bearings in this test: Is that correct?

A. No, I did not say that exactly. What I said was the greater the viscosity of the fluid the greater the pressure developed.

Q. How about the rapidity of flow through it?

(Testimony of E. P. Lesley.)

A. I made no measurements of the rapidity of flow.

Mr. LYON.—That is all.

Redirect Examination.

Mr. TOWNSEND.—Q. Have you the apparatus in the courtroom that you made this test with?

A. Yes.

Q. Will you kindly exhibit that to the Court?

A. Yes. This is the model that was constructed. This is the bearing which is provided with a spiral oil groove. This is the collar provided into which we could feed oil, or into which we could put grease here. This bearing screws into a flange which is the upper portion of the steel chamber; at this point and there, tubes led either way; there were originally provided both with stop-cocks, and we could attach to these either pressure gages or sight gages to see how high the rotation of this shaft would hold the lubricant fed at this point. That is, we could [821] see with the rotation of the shaft, with the spiral groove there or with the helical groove there, although this small film would fill the entire chamber, fill the whole bearing, and fill it up to this level, with no rotation there would be maintained only a condition of equilibrium in the tube column. On this pipe and this one, upon rotation, so that the direction of rotation is in a downward direction of the helical groove, it containing a supply at this point, the lubricant will be driven downward and upward in this tube, and if our tube is approximately long enough until it would run out at the

(Testimony of E. P. Lesley.)

top. For a mixture, it would run over higher. We used stop-cocks as shown here, so that we could attach pressure gages. The device was driven from a motor with a belt. We tried various speeds of rotation, and I determined that the developed pressure varied with the rotated speed.

Mr. TOWNSEND.—I offer the apparatus referred to by the witness as Defendants' Exhibit "Z."

Mr. LYON.—Objected to as irrelevant and immaterial, and incompetent. All that the witness claims is that it shows pressure. He doesn't show how much oil or how much lubricant he gets.

The COURT.—Overruled.

Mr. LYON.—Note an exception.

Mr. TOWNSEND.—Q. Is that groove in this device the same as in the pump?

A. As near as it is mechanically possible to make it. The intention was to make it exactly alike. The shaft is entirely smooth. I would like to say to the Court that the action surprised me, I did not myself believe that it could be so considerably different. The shaft is entirely smooth. It is installed at the bottom of the bearing, and [822] rests on the bottom, on a conical pin at this point. Its weight is partially supported by a ball thrust and bearings at the top; that is the shaft in this chamber.

The COURT.—Where is that groove?

A. The groove is over here.

Q. It isn't quite clear to me why the action there would be the same as that going on down and out

(Testimony of E. P. Lesley.)

here. The centrifugal force here would tend to do that. Where does the oil leave this bearing now?

A. The oil?

Q. To get into this pipe.

A. At the bottom of the bearing. That is as far as we are able to see.

Q. Where does it come out?

A. It comes around the clearance of the bearing; the clearance of this, as close as we are able to make it, is 6/1000ths of an inch. To prove that it was not centrifugal action that created the downward pressure, we turned this in the other direction, and the fluid was immediately pumped out and ran over the top of the bearing.

Mr. LYON.—Q. You don't know how much lubricant of any particular viscosity would be pumped through one of these bearings, according to these experiments of yours, in a given length of time?

A. I made no determination of the quantity of lubricant that would be pumped through, of any particular lubricant in a given time.

Q. Have you any idea as to that, Professor?

A. Yes, Mr. Lyon, I have merely a rough idea. As I remember it, it was a 2 to 1 mixture, 2 of water and 1 of oil; it may have been the other. I made all the way from 1 water to 2 oil up to 1 water and 10 oil. Pardon me, I am all wrong about that. 1 water and 2 oil, and 1 oil and 10 water, and then straight water. I merely stood with a tomato can—this tube is screwed into this portion [823] here, and then a little tube put above there, so I could pour it in, and I poured it in a fair stream, I should

(Testimony of E. P. Lesley.)

say perhaps a pint, in two or three minutes.

Q. Do you think that that kind of a mixture, your emulsifying oil,—take the oil alone, for instance, that you used there, that that would run that quantity through in five minutes?

A. You mean running a pint through in five minutes?

Q. No, the quantity you said. I think you said half a pint in five minutes.

A. Yes, I think it would run half a pint through in five minutes.

Mr. LYON.—The plaintiff rests, your Honor.

The COURT.—Now, how do you want to dispose of the case, gentlemen?

Mr. TOWNSEND.—Does your Honor desire to hear oral argument, or do you desire to have the case submitted on points and authorities?

Mr. LYON.—We would prefer oral argument, your Honor, if you have the time—some of it, at least. However, we will be pleased to suit the convenience of the Court.

The COURT.—I don't know whether oral argument would be of very much assistance, or not.

Mr. TOWNSEND.—I may suggest that if your Honor contemplates taking the case under advisement, we would probably only be taking up your Honor's time by an oral argument. Of course, if you were in a position to decide the case at the end of an oral argument, it would expedite matters.

The COURT.—I am rather pressed for time. I dislike to say I will not hear oral argument, because, ordinarily, I prefer to leave that matter entirely

to counsel. Sometimes oral [824] argument is of assistance, especially where I have not heard the evidence myself.

Mr. LYON.—If your Honor does not think it would be of assistance to you, we will not press for oral argument. We will agree to submit it on points and authorities.

The COURT.—I cannot very well say that it would not be of assistance. Counsel, perhaps, would know better than I as to whether or not oral argument would be of assistance. Oral argument would not be of very much assistance in weighing the testimony, for instance. As a general rule, unless there are some particular points for oral argument, I do not think it is of very much assistance. I must take the case under submission anyway.

Mr. LYON.—Then we will submit it on points and authorities. That is satisfactory to the plaintiff. What time would you say?

(After some discussion, it was agreed that the cause be submitted on briefs to be filed, 20, 20 and 30.)

The COURT.—Gentlemen, this device which has been introduced here just now, it occurs to me that it is rather cumbersome for the clerk to take care of. I do not think it is very material.

Mr. TOWNSEND.—Well, it is only to have it here, your Honor. It could be marked for identification and withdrawn, and then used on the argument, or it could be presented at any time the Court desired to see it, if your Honor thinks you would care to see it.

The COURT.—I believe that would be the better plan. It is so cumbersome that I dislike bothering the clerk with it. I think you may withdraw it.

Mr. LYON.—And it is understood that the one exhibit I [825] spoke of, the certified copy from Los Angeles, can be filed as soon as it is received, and have the same force and effect as though filed in open court.

The COURT.—Yes.

[Endorsed]: Filed Oct. 13, 1920. W. B. Maling, Clerk. By J. A. Schaertzer, Deputy Clerk. [826]

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In the District Court of the United States for the  
Northern District of California Second Division.

IN EQUITY—No. 485.

LAYNE & BOWLER CORPORATION,  
Plaintiff,

vs.

WESTERN WELL WORKS, INC. (a Corporation),  
ROTARY DRILLING & DEVELOPMENT COMPANY (a Corporation),  
STANLEY M. HALSTEAD, P. E. VAUGHAN  
and ALLEN W. ROSS,

Defendants.

**Opinion.**

FREDERICK S. LYON, WILLIAM K. WHITE  
and LEONARD S. LYON, Attorneys for Plaintiff.

CHAS. E. TOWNSEND and WILLIAM A. LOFTUS,  
Attorneys for Defendants.

DIETRICH, District Judge.

Plaintiff is the holder by assignment of United States patent numbered 821,653, issued to Mahlon E. Layne on May 29, 1906, on application filed therefor April 28, 1903. It relates to a well mechanism, more particularly designed for pumping from deep, bored wells. The defendants are charged with infringing claims 9, 13 and 20, which are as follows:

"9. In well mechanism the combination with a pump casing, of a rotary pump of a jointed pump shaft and a closed casing surrounding the pump shaft from the pump to the top of the well."

"13. The combination with a pump and its actuating shaft of a sectional casing therefor provided at each end of each section with a fixed block with bearings for the shaft, the casing being closed at the top and provided with an air vent." [827]

"20. The combination of a well casing, a rotary pump therein, and a line shaft for the pump entirely closed off from the water in the well."

The same patent was involved in *El Campo Machine Co. vs. Layne*, 195 Fed. 83, *Van Ness vs. Layne*, 213 Fed. 804, and *Getty vs. Layne*, 262 Fed. 141. In the *El Campo* case claim 13 was held to be valid, and in the *Van Ness* case claim 9 was thought to be substantially the same as claim 20, and the validity of the latter was expressly adjudged. Additional defenses are put forward here, but upon the whole I find in them no substantial reason for reaching a different conclusion, and hence, without giving consideration to the plaintiff's contention that the defendants are estopped from questioning its validity, these three claims of the patent are sus-



tained. As frankly stated by counsel for the defendants, the issue is a narrow one, "the chief question being one of infringement," and the task is to determine the nature and scope of the plaintiff's patent and compare it with the defendants' structure. The problem of the inventor was not a new type of pump or pump runner, but, broadly speaking, how to install an existing rotary type—preferably centrifugal—operate it, withdraw it for repairs, and replace it, without the necessity of a man entering the well. And, of course, to be practical, the device must, under ordinary operating conditions, be efficient and reasonably durable. Layne's conception was of a jointed or sectional mechanism, providing, when assembled, a driving shaft, connecting the pump runner at the bottom of the well with the actuating power at the surface, a continuous enclosing casing for the shaft, and a conduit through which the water is pumped to the surface, the sections to be of any desired length and added one at a time as the pump is lowered in the well, the assembled mechanism finally to hang pendant from supports at the surface. He suggests that the driving shaft and its casing may be carried upon the outside of the water conduit or within, but in either case the two are to be attached together at intervals to give increased strength and rigidity. An ingenious provision by which [828] the pump or propeller casing may be wedged in and made immovable at any point in the well by operating a lever at the surface is covered in some of the claims, but the feature is not a part of the generic idea, and is not presently involved. In practice the

wedging was found to be unnecessary and has never been used. An essential part of the main problem was to provide bearings to hold the driving shaft in alignment together with means for lubricating them and keeping them free from the sand more or less generally carried in the water. In the inventor's conception, these three functions were to be performed by the shaft casing. Reinforced by the conduit casing to which it is attached and subjected to the pull of the pendant weight, it would serve as a rigid footing for the requisite bearings. Being substantially water-tight, it would keep the sand out and at the same time serve as a conduit through which to furnish oil to the bearings. It was undoubtedly Layne's desire and purpose in so far as possible to exclude the water from the shaft casing, but perfect mechanical inclosure of the shaft is, of course, unattainable; it must protrude from the stationary casing to connect with the rotating propeller, at a point where the pressure of the water is the greatest, and a bearing at that point so close fitting as to entirely exclude the water could not be lubricated, and hence would be impracticable. The provision made by the patent is for a long bearing equipped with a stuffing-box, which, in conjunction with the down pressure of the oil in the casing, serves under ordinary operating conditions, as an effective barrier to the sand, if it does not entirely exclude the water.

If we visualize the plaintiff's combination invention, as disclosed by the patent, in one of its possible concrete forms, we see in the assembled mechanism, when installed, the pump or propeller with its

easing, at the bottom of the well; connecting with this casing a large pipe made up of sections coupled together, through which the water is carried to the surface; within this conduit and concentric therewith a much smaller pipe built up of similar sections, the two being firmly attached to each other at [829] suitable intervals by "spiders" or some other contrivance that does not seriously obstruct the flow of water; within the smaller casing and concentric therewith, the driving shaft, also made up of sections of the same length as the corresponding sections of the casings, the shaft connecting with the propeller at the bottom and a pulley or other suitable device, at the top, for receiving the power, and held in alignment by bearings constituting a part of the casing, the bearing at the bottom where the shaft protrudes to engage the propeller being fitted with a stuffing-box. In operation the oil is fed into the shaft casing above the uppermost bearing, and running down in the space between the casing and the shaft passes through the bearing, and thence down the casing through the several bearings, lubricating all in series. Manifestly if the oil is fed into the casing faster than it is dissipated, the vacant space will in time fill up and the column of oil thus formed will press upon and have a tendency to escape out of the lowest bearing, thus co-operating with the stuffing-box in excluding the water. That the structure may be installed and again taken out for repairs without the necessity of a man going beneath the surface is conceded, and that it is reasonably practical conclusively appears from its general use. Though not, strictly speak-

ing, a pioneer, the patent is of a fundamental, generic character, and in expressing his conception in physical form the patentee is entitled to a reasonable range of mechanical equivalents.

I do not attempt minutely to describe the defendants' structure. Long before they entered upon its manufacture they were intimately familiar with the plaintiff's mechanism both from the patent itself and from actual installations in the field. While in the unassembled parts there are many minor differences of construction, in the assembled structures I find no substantial distinction. Both accomplish the same result by substantially the same means, operating in substantially the same way. The defendants' structure is sectional, and is installed and removed from the well in the same manner as that of the plaintiff. There is a close [830] correspondence between the shaft sections, shaft casing sections and water conduit sections. The fact that in the defendants' mechanism the shaft bearing is an integral part of the combination coupling for both the shaft casing and the water conduit sections, and that no part of the pendant weight is carried by the shaft casing, while in the plaintiff's structure the bearings are built into the shaft casing alone or its coupling, is unimportant. In either case, when the members are assembled they constitute indispensable and integral parts of a single mechanism, and the two assembled mechanisms are strikingly similar in both form and function. In the Halstead patent (No. 1,228,770—June 5, 1917), under which the defendants profess to act, open joints in the shaft casing are specified, for the pur-

pose, it is said, of admitting small quantities of water therein, the contention being that by using as a lubricant emulsifying oil, which will mingle with the water thus admitted, the cost of lubrication may be materially reduced. The practicality of the idea may be doubted, but it need not be discussed. While in the earlier stages of the trial defendants vigorously resisted the plaintiff's contention that in the structure they actually installed in the field the shaft casings were made water-tight, the position was virtually abandoned before the close of the hearing; but, however that may be, the plaintiff's contention is thought to be supported by the overwhelming weight of the evidence. At the outset the defendants may have undertaken to follow the teaching of the Halstead patent, but at the time the suit was commenced they were using great care so to construct and assemble the sections and their connecting parts that when assembled a perfect union was made between the casing and coupling, to the complete exclusion of water; and as added safeguards, the joints were sealed with white lead, and for a considerable distance the space between the driving shaft and the walls of the casing was packed with hard grease. [831]

By the defendants much importance is attached to a feature of their lowermost shaft bearing—the one corresponding to the bearing in the plaintiff's mechanism equipped with a stuffing-box. In the lower portion of this bearing an annular groove is cut in the babbitt, leading from which small vents or slots are provided extending through the hub to the outside. For this device it is claimed the lubri-

cant in the casing will work downward until it reaches the groove, and the water on the outside will have a tendency to traverse the bearing in an upward direction until the groove is encountered, and there both the water and the lubricant, following the lines of least resistance, will discharge into the well through the ducts. Upon this theory it must be apparent that so much of the bearing as is below the groove will receive no lubricant at all, and being open to the sand carried in the water, will in time cut out and cease to function as a bearing. But if it be assumed that the contrivance is possessed of both novelty and utility and is patentable as an improvement, it still remains true that in utilizing it the defendants also appropriate the basic idea of the plaintiff's invention. It is not a case where the plaintiff's mechanism is a failure and the defendants have, by a slight invention or the invention of a small element, turned it into a success. Admittedly the plaintiff's mechanism is a success, and hence the most that could be said for the defendants' device is that it is an improvement.

It is also earnestly insisted by defendants that the two systems are differentiated by the fact that their lubricating system is circulatory, while that of the plaintiff is static. In one or two of the decisions cited *supra* more importance is attached to this consideration than under the evidence here I have been able to accord to it. Under the facts disclosed, the distinction is more apparent than real. In both cases the oil is fed in at the top in substantially the same manner, and under the force of gravity traverses the entire length of the shaft casing, lubri-

cating all of the bearings in its course. In the actual operation of the plaintiff's mechanism [832] there is necessarily some escape of thin oil through the bottom bearing; for, as already explained, a perfect closure at this point cannot be maintained. Possibly a larger quantity will escape at the bottom of defendants' structure; but even there, it is to be borne in mind, the lubricant must traverse a bearing of considerable length before it reaches the groove, and to some extent its down flow is resisted by the upward pressure of the water, which is only reduced and not wholly eliminated by the means described. Indeed, it is very probable that in both mechanisms a comparatively static condition is, under ordinary conditions, maintained at the lower end of the casing, due to the counter action or counter resistance of the columns of oil and water, one against the other. In the plaintiff's mechanism a contrivance is provided for drawing or forcing out of the casing the residuum of spent or impure lubricants; but it cannot be said that the groove and vents in defendants' structure perform such a function. If, as I have been constrained to find, in the defendants' actual installations, the shaft casing is made impervious to water and it is packed for a considerable distance above and below each bearing with a hard, immobile grease, the only possible function of which can be to prevent the ingress of water, to impede the progress of the lubricating oil, and itself to serve as a lubricant, it must be held that the term "circulatory lubricating system" is a misnomer, and that the difference in that respect between the two systems is colorable only. But, were

the contrary view to be taken, it would still remain true that the plaintiff's lubricating system is practical and efficient, and is a part of its combination invention, the fruits of which another may not rightfully appropriate by substituting for a single and successful feature other means for accomplishing the same result.

Accordingly it is thought that the plaintiff is entitled to the relief prayed for, and hence a decree in the usual form will be entered in its favor.

[Endorsed]: Filed Dec. 27, 1920. Walter B. Maling, Clerk. [833]

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In the Southern Division of the United States District Court, in and for the Northern District of California, Second Division.

IN EQUITY—No. 485.

LAYNE & BOWLER CORPORATION,

Plaintiff,

vs.

WESTERN WELL WORKS, INC. (a Corporation), ROTARY DRILLING & DEVELOPMENT COMPANY (a Corporation), STANLEY M. HALSTEAD, P. E. VAUGHAN and ALLEN W. ROSS,

Defendants.



At a stated term of the District Court of the United States for the Southern Division of the Northern District of California, Second Division, to wit, the November, 1920, term, held at the courtroom thereof at the City and County of San Francisco, State of California, on the 31st day of December, A. D. 1920. Present: Honorable WILLIAM H. HUNT, Circuit Judge.

**Interlocutory Decree.**

This cause having heretofore come on regularly to be heard and tried in open court before United States District Judge Frank S. Dietrich, upon the pleadings and proofs, documentary and oral, taken and submitted in the case and being of record therein, the plaintiffs being represented by Messrs. Frederick S. Lyon, William K. White and Leonard S. Lyon, and the defendants by Messrs. Charles E. Townsend and William A. Loftus, and the cause having been submitted on briefs to the Court for its consideration and decision, and the Court being now fully advised in the premises and its opinion having been rendered and filed herein, it is hereby ORDERED, ADJUDGED AND DECREED as follows:

I. That the plaintiff, Layne & Bowler Corporation, [834] and the defendants, Western Well Works, Inc., and Rotary Drilling & Development Company, were and are, respectively, corporations, all as alleged in the bill of complaint herein and that all the allegations respectively contained in paragraphs II and III of said bill of complaint are true.

II. That the United States letters patent No. 821,653 issued on May 29, 1906, to Mahlon E. Layne for "Well Mechanism," in respect to the claims charged to have been infringed, to wit, claims 9, 13 and 20, thereof, are in all respects good and valid in law; that by a regular chain of assignments, duly executed by the parties thereto and duly delivered, said Mahlon E. Layne, prior to the commencement of this suit, sold, assigned and transferred unto the plaintiff, Layne & Bowler Corporation, the full and exclusive right, title and interest in and to said letters patent No. 821,653 for, to and in the State of California, and in and to all rights of action, claims and demands arising out of or accruing from the past infringement of said letters patent within the State of California, and ever since the plaintiff has been and now is the sole and exclusive owner of said exclusive right, title and interest in and to said letters patent and of all said rights of action, claims and demands.

III. That since the issuance of said letters patent, the invention, covered by said claims 9, 13 and 20, went into general use and upon each well mechanism embodying said invention and respectively sold by said Mahlon E. Layne, his various licensees and by the plaintiff, there has been marked the word "Patented" together with the date of said letters patent.

IV. That subsequent to April 15, 1915, and prior to the filing of the bill of complaint herein, and within the Southern Division of the Northern District of California, without the license or consent of plaintiff, or of its predecessors in interest, the de-

fendants, Western Well Works, Inc., Stanley M. Halstead, Rotary Drilling & Development Company, [835] P. E. Vaughan and Allen W. Ross have jointly made, used and sold well mechanism embodying the invention described in said letters patent and claimed and protected in and by said claims 9, 13 and 20 and thereby did infringe upon said claims and upon each of them.

V. That none of the defenses set up in the defendants' answer herein are sustained by the evidence and that each and all of said defenses be and the same are hereby overruled.

VI. That the defendants, Western Well Works, Inc., Rotary Drilling & Development Company, Stanley M. Halstead, P. E. Vaughan and Allen W. Ross, and each of them, their respective attorneys, agents, servants and employees, and each of them, and the respective officers of said two defendant corporations, be and they are and each of them is hereby permanently enjoined and restrained from making, using or selling or causing to be made, used or sold, any well mechanism embodying or containing the invention described in said letters patent and claimed in and by said claims 9, 13 and 20 of said letters patent No. 821,653, or either or any of said claims, and from infringing upon and from contributing to the infringement of said claims, or either or any of them, and that a permanent writ of injunction be issued out of and under the seal of this court commanding and enjoining the said defendants, their attorneys, officers, agents, servants and employees, as aforesaid, which said claims read as follows:

"9. In well mechanism the combination with a pump casing, of a rotary pump of a jointed pump shaft and a closed casing surrounding the pump shaft from the pump to the top of the well."

"13. The combination with a pump and its actuating shaft of a sectional casing therefor provided at each end of each section with a fixed block with bearings for the shaft, the casing being closed at the top and provided with an air vent." [836]

"20. The combination of a well casing, a rotary pump therein, and a line shaft for the pump entirely closed off from the water in the well."

VII. That the plaintiff do have and recover of and from the said defendants, Western Well Works, Inc., Rotary Drilling & Development Company, Stanley M. Halstead, P. E. Vaughan and Allen W. Ross, the profits of which said defendants have realized and the damages which the plaintiff has sustained from and by reason of the infringement aforesaid, and for the purpose of ascertaining and stating the amount of said profits and damages, IT IS ORDERED, ADJUDGED AND DECREED that this cause be referred to Honorable H. M. Wright, Esq., standing Master in Chancery of this court, to ascertain, take, state and report to this court an account of all the profits received, realized or accrued by and to the defendants and each of them, and to assess all the damages suffered by the plaintiff from and by reason of the infringement aforesaid, and that on said accounting the plaintiff have the right to cause an examination of the respective officers, agents, servants, attorneys, workmen and employees of the defendants, *ore tenus*,

and also be entitled to the production of the books, vouchers, documents and records of the defendants in connection with the accounting, and that the said defendants, their officers, agents, servants, attorneys, workmen and employees attend for such purpose before the Master from time to time as the Master shall direct.

IT IS FURTHER ORDERED, ADJUDGED AND DECREED that the plaintiff do have and recover its costs and disbursements in this suit to be hereafter taxed, and that plaintiff have the right to apply to the Court from time to time for such other and further relief as may be necessary and proper in the premises.

WM. H. HUNT,  
U. S. Judge. [837]

Receipt of copy of the within proposed Decree admitted this 28th day of Dec., A. D. 1920.

CHAS. E. TOWNSEND and  
WM. A. LOFTUS,

For Defts.

Approved as to form.

CHAS. E. TOWNSEND,  
Atty. for Defts.

[Endorsed]: Filed and entered December 31, 1920.  
Walter B. Maling, Clerk. By J. A. Schaertzer,  
Deputy Clerk. [838]

(Title of Court and Cause.)

**Petition for Order Allowing Appeal.**

To the Honorable Court, Above Entitled:

The above-named defendants, Western Well Works, Inc., Rotary Drilling & Development Company, Stanley M. Halstead, P. E. Vaughan and Allen W. Ross, conceiving themselves aggrieved by the decree filed and entered on the 31st day of December, 1920, in the above-entitled cause, do hereby appeal therefrom to the United States Circuit Court of Appeals for the Ninth Judicial Circuit, for the reasons and on the grounds specified in the assignment of errors, which is filed herewith, and prays that this appeal may be allowed, that a citation issue as provided by law, and that a transcript of the record, proceedings, exhibits and papers, upon which said decree was made and entered as aforesaid, duly authenticated, may be sent to the Circuit Court of Appeals for the Ninth Circuit, sitting at San Francisco.

And your petitioners further pray that an order be made fixing the amount of security which the defendants shall give and furnish upon such appeal, and that upon giving such security all further proceedings in this court, including the injunction, be suspended and stayed until the determination of said appeal by said United States Circuit Court of Appeals for the Ninth Circuit.

CHAS. E. TOWNSEND,  
WM. A. LOFTUS,  
Solicitors for Defendants. [839]

(Title of Court and Cause.)

**Order Allowing Appeal.**

The foregoing petition for appeal is allowed and upon the petitioners filing a bond in the sum of Five Thousand (\$5,000.00) Dollars with sufficient sureties, to be conditioned as required by law, same shall operate to suspend and stay all further proceedings in this court, as well as the injunction, until the determination of said appeal by the United States Circuit Court of Appeals for the Ninth Circuit; provided and further conditioned that the record on appeal be filed in the office of the clerk of the Court of Appeals on or before January 8th, 1921, and the cause docketed for hearing at the February, 1921, term of said Court of Appeals.

WM. H. HUNT,

United States Circuit Judge.

Service of the within petition for order allowing appeal and order allowing appeal admitted this 31st day of December, A. D. 1920.

WM. K. WHITE,

For Plaintiff.

[Endorsed]: Filed Dec. 31, 1920. W. B. Maling, Clerk. By J. A. Schaertzer, Deputy Clerk. [840]

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(Title of Court and Cause.)

**Assignment of Errors.**

Now come Western Well Works, Inc., Rotary Drilling & Development Company, Stanley M. Hal-

stead, P. E. Vaughan and Allen W. Ross, defendants in the above cause in the court below, and appellants herein, by Chas. E. Townsend, Esq., and Wm. A. Loftus, Esq., their solicitors and counsel, and say that in the record and proceedings in the said cause in the said court below there is manifest error, and they particularly specify as the errors upon which they will rely and which they will urge upon their appeal in the above-entitled cause:

(1) That the District Court of the United States for the Northern District of California, Southern Division, erred in holding that the defendants and or either of them had infringed any of the claims of the patent in suit.

(2) That the District Court of the United States for the Northern District of California, Southern Division, erred in holding that the patent and or any of the claims thereof was or are valid.

(3) That the District Court of the United States for the Northern District of California, Southern Division, erred in holding that the alleged invention covered by claims 9, 13 and 20, or any of them, had gone into general or any use.

(4) That the District Court of the United States for the Northern District of California, Southern Division, erred in not dismissing the bill of complaint against the defendant, Rotary Drilling & Development Co.

(5) That the District Court of the United States for the Northern District of California, Southern Division, erred in enjoining defendants, or any of them, from the manufacture, [841] sale or use of the defendants' structure alleged to infringe.



(6) That the District Court of the United States for the Northern District of California, Southern Division, erred in not dismissing the bill of complaint.

In order that the foregoing assignment of errors may be and appear of record, the appellants present the same to the Court, and pray that such disposition be made thereof as in accordance with the law and the statutes of the United States in such cases made and provided.

All of which is respectfully submitted.

CHAS. E. TOWNSEND,

WM. A. LOFTUS,

Solicitors for Appellants.

Service of copy of the within assignment of errors, admitted this 31st day of December, A. D. 1920.

WM. K. WHITE,

For Appellee.

[Endorsed]: Filed Dec. 31, 1920. W. B. Maling, Clerk. By J. A. Schaertzer, Deputy Clerk. [842]

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(Title of Court and Cause.)

**Stipulation and Order Respecting Record on Appeal.**

IT IS HEREBY STIPULATED AND AGREED by and between the above-named parties that the transcript of record on appeal herein shall include and embrace the entire record of all the proceedings, testimony, in the exact words of the respective witnesses, evidence and proofs taken, ad-

duced or introduced on and during the final hearing of the above-entitled cause.

IT IS FURTHER STIPULATED that all original exhibits offered in evidence in said cause may be withdrawn from the files of the above-entitled court and of the clerk thereof and by said clerk be transmitted to the United States Circuit Court of Appeals for the Ninth Circuit as a part of said record on appeal; the said original exhibits to be returned to the files of this court upon the determination of said appeal by said Circuit Court of Appeals.

FREDERICK S. LYON,  
WILLIAM K. WHITE,  
LEONARD S. LYON,

Solicitors for Plaintiff.

CHAS. E. TOWNSEND,  
WM. A. LOFTUS,

Solicitors for Defendants.

**ORDER.**

The foregoing stipulation is hereby approved and an order to the same effect is hereby made.

W. H. HUNT,  
Circuit Judge.

Dated December 31, 1920.

[Endorsed]: Filed Dec. 31, 1920. W. B. Maling,  
Clerk. By J. A. Schaertzer, Deputy Clerk. [843]

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(Title of Court and Cause.)

**Bond on Appeal.**

KNOW ALL MEN BY THESE PRESENTS:  
That we, Western Well Works, Inc., Rotary Drill-

ing & Development Company, Stanley M. Halstead, P. E. Vaughan and Allen W. Ross, the appellants herein, as principals, and United States Fidelity & Guaranty Company, a corporation, duly organized and existing under and by virtue of the laws of the State of Maryland, as surety, are held and firmly bound unto the above-named appellee, Layne & Bowler Corporation, in the sum of Five Thousand (\$5,000.00) Dollars, lawful money of the United States of America, for the payment of which, well and truly to be made unto the said Layne & Bowler Corporation, its successors and assigns, we bind ourselves, our successors and assigns, jointly and severally, firmly by these presents; upon condition nevertheless, that

WHEREAS, the said appellants, Western Well Works, Inc., Rotary Drilling & Development Company, Stanley M. Halstead, P. E. Vaughan and Allen W. Ross, have an appeal to the United States Circuit Court of Appeals for the Ninth Circuit to reverse the interlocutory decree for an injunction granted in the above-entitled suit in the District Court of the United States for the Northern District of California, Southern Division, which said interlocutory decree was entered in said District Court on the 31st day of December, 1920, and an appeal allowed superseding said decree.

Now, therefore, the condition of this obligation is such that if the above-named appellants shall prosecute said appeal to effect and answer all damages and costs, if they shall fail to make their plea good, and shall pay all damages and profits which may result from its or their pumps, the

manufacture and sale of which was by the said injunction enjoined from and after the date [844] herein until the final decision of the said Circuit Court of Appeals thereon, then this obligation shall be void; otherwise the same shall be and remain in full force and virtue.

But it is understood that this bond shall not be considered as securing the payment of any damages or profits which may have resulted from the manufacture and sale of said infringing devices prior to the date hereof.

IN WITNESS WHEREOF, the corporate name and seal of the said principal, Western Well Works, Inc., is hereunto affixed and attested by its duly authorized officers, and the corporate name and seal of said surety has been hereunto duly affixed and attested by its attorneys in fact, thereunto duly authorized at San Francisco, California, this 4th day of January, 1921.

WESTERN WELL WORKS, INC.

[Seal]

Per P. E. VAUGHAN,  
President.

Per S. M. HALSTEAD,  
Secy. and Treas.

UNITED STATES FIDELITY & GUAR-  
ANTY COMPANY.

[Seal]

By HENRY V. D. JOHNS,  
By JAMES M. KENNEDY,  
Attorneys in Fact.

State of California,  
City and County of San Francisco,—ss.

On this 4th day of January, in the year one thousand nine hundred and 21, before me, Muriel

Atherton Russell, a notary public in and for the City and County of San Francisco, personally appeared Henry V. D. Johns and James M. Kennedy, known to me to be the persons whose names are subscribed to the within instrument as the attorneys in fact of the United States Fidelity and Guaranty Company, and acknowledged to me that they subscribed the name [845] of the United States Fidelity and Guaranty Company thereto as principal, and their own names as attorneys in fact.

[Seal] MURIEL ATHERTON RUSSELL,  
Notary Public in and for the City and County of  
San Francisco, State of California.

State of California,  
County of Santa Clara,—ss.

On this third day of January, in the year 1921, before me, Wesley Pieper, a notary public in and for the County of Santa Clara, State of California, personally appeared P. E. Vaughan, known to me to be the president, and S. M. Halstead, known to me to be the secretary-treasurer of the corporation that executed the within instrument, and acknowledged to me that such corporation executed the same.

In witness whereof, I have hereunto set my hand and affixed my official seal at my office in said county of Santa Clara the day and year in this certificate first above written.

[Seal] WESLEY PIEPER,  
Notary Public in and for the County of Santa  
Clara, State of California.

My commission expires November 26, 1922.

Office: 16 West Santa Clara St., San Jose, Cal.

(Premium charged for this bond is \$50.00 per annum.)

The foregoing bond is hereby approved to operate as a supersedeas to said injunction.

WM. H. HUNT,  
Judge.

[Endorsed]: Filed Jan. 4, 1921. W. B. Maling, Clerk, By J. A. Schaertzer, Deputy Clerk. [846]

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In the Southern Division of the United States District Court, in and for the Northern District of California, Second Division.

No. 485—EQUITY.

LAYNE & BOWLER CORPORATION,  
Plaintiff,

vs.

WESTERN WELL WORKS, INC., a Corporation,  
et al.,

Defendants.

**Certificate of Clerk U. S. District Court to Transcript of Record.**

I, Walter B. Maling, Clerk of the District Court of the United States, in and for the Northern District of California, do hereby certify the foregoing eight hundred and forty-six (846) pages, numbered from 1 to 846, inclusive, to be full, true and correct copies of the record and proceedings as the same remain on file and of record in the above-entitled cause, and that the same constitute the record on

appeal to the United States Circuit Court of Appeals for the Ninth Circuit.

I further certify that the cost of the foregoing transcript of record is \$369.95; that said amount was paid by the defendants; and that the original citation issued herein is hereunto annexed.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the seal of said District Court this 5th day of January, A. D. 1921.

[Seal]                      WALTER B. MALING,  
Clerk United States District Court for the Northern  
District of California. [847]

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**Citation.**

UNITED STATES OF AMERICA,—ss.

The President of the United States, to Layne & Bowler Corporation, GREETING:

You are hereby cited and admonished to be and appear at a United States Circuit Court of Appeals for the Ninth Circuit, to be holden at the city of San Francisco, in the State of California, within thirty days from the date hereof, pursuant to an order allowing an appeal, of record in the clerk's office of the United States District Court for the Northern District of California, Second Division, wherein Western Well Works, Inc. (a Corporation), Rotary Drilling & Development Company (a Corporation), Stanley M. Halstead, P. E. Vaughan and Allen W. Ross are appellants, and you are appellee, to show cause, if any there be, why the decree rendered against the said appellants, as in

the said order allowing appeal mentioned, should not be corrected, and why speedy justice should not be done to the parties in that behalf.

WITNESS, the Honorable WILLIAM H. HUNT, United States Circuit Judge for the Ninth Judicial Circuit, this 4th day of January, A. D. 1921.

W. H. HUNT,  
United States Circuit Judge. [848]

Service of a true copy of the within citation acknowledged this 4th day of January, 1921.

WM. K. WHITE,  
Attorney for Layne & Bowler Corporation,  
Plaintiff-Appellee.

[Endorsed]: No. 485—Eq. United States District Court for the Northern District of California. Western Well Works, Inc., a Corporation, et al., Appellants, vs. Layne & Bowler Corp. Citation on Appeal. Filed Jan. 4, 1921. W. B. Maling, Clerk. By J. A. Schaertzer, Deputy Clerk.

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[Endorsed]: No. 3627. United States Circuit Court of Appeals for the Ninth Circuit. Western Well Works, Inc., a Corporation, Rotary Drilling & Development Company, a Corporation, Stanley M. Halstead, P. E. Vaughan and Allen W. Ross, Appellants, vs. Layne & Bowler Corporation, Appellee. Transcript of Record. Upon Appeal from the Southern Division of the United States District



*vs. Layne & Bowler Corporation.* 913

Court for the Northern District of California,  
Second Division.

Filed January 6, 1921.

F. D. MONCKTON,

Clerk of the United States Circuit Court of Appeals  
for the Ninth Circuit.

By Paul P. O'Brien,  
Deputy Clerk.

# **Vol. III**

## **TRANSCRIPT OF RECORD.**

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**SUPREME COURT OF THE UNITED STATES.**

**OCTOBER TERM, 1922.**

**No. 278.**

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**LAYNE & BOWLER CORPORATION, PETITIONER,**

**vs.**

**WESTERN WELL WORKS, INC.; ROTARY DRILLING AND  
DEVELOPMENT COMPANY, STANLEY M. HALSTEAD,  
ET AL.**

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**ON WRIT OF CERTIORARI TO THE UNITED STATES CIRCUIT COURT  
OF APPEALS FOR THE NINTH CIRCUIT.**

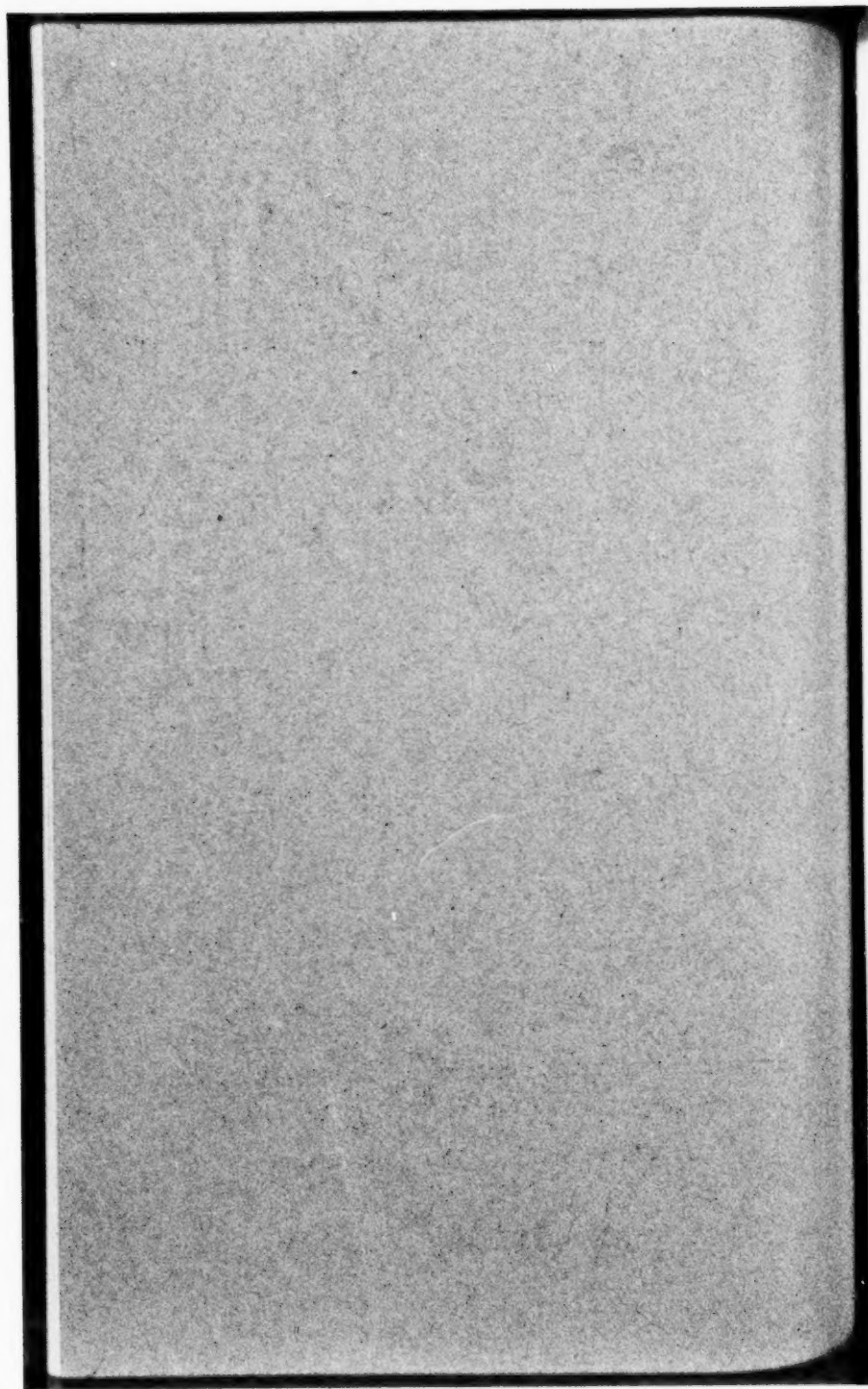
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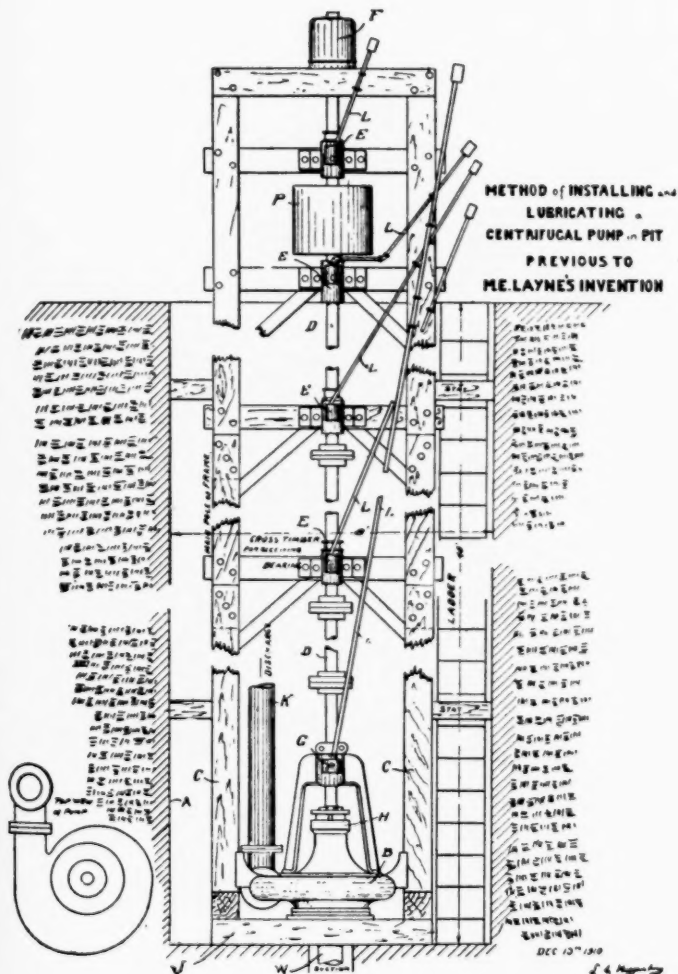
**PETITION FOR CERTIORARI FILED FEBRUARY 24, 1923.**

**CERTIORARI AND RETURN APRIL 24, 1923.**

**(28,729)**



Plaintiff's Exhibit No. 2.



[Endorsed]: 485-Eq. Plaintiff's Exhibit No. 2.  
Filed Sept. 3, 1920. W. B. Maling, Clerk. By J. A.  
Schaertzer, Deputy Clerk.

No. 3627. United States Circuit Court of Appeals  
for the Ninth Circuit. Filed Jan. 6, 1921. F. D.  
Monckton, Clerk.

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**Plaintiff's Exhibit No. 3.**

**CONTRACT.**

THIS CONTRACT, made this first day of October, 1914, between THE LAYNE AND BOWLER CORPORATION, a corporation duly organized and existing under and by virtue of the laws of the STATE of California, and having its principal place of business at Los Angeles, California, hereinafter referred to as first party, and STANLEY M. HALSTEAD, of San Jose, California, and P. E. VAUGHAN, of Los Angeles, California, hereinafter referred to as second parties,

**WITNESSETH:**

WHEREAS the first party is extensively engaged in the manufacture, sale and use of certain patented pumps, screens, and other appliances used in the making and developing of wells throughout California, Arizona and New Mexico, and

WHEREAS the second party, S. M. Halstead, who has been heretofore employed by the first party in various capacities, and the second party, P. E. Vaughan, are desirous of starting up together in a separate and independent business, contemplating

the purchase of said patented pumps and screens from the first party, and the subsequent use thereof in the building, developing or equipping of wells, in the manner and subject to the conditions hereinafter specified,

NOW THEREFORE, the Parties Agree as follows:

### PROVISIONS.

#### 1.

The first party agrees to sell to the second party, its Screens, Pumps and Parts of Pumps for the purposes of repairs, replacement or extensions, and the second parties agree to accept delivery thereof f.o.b. cars Los Angeles proper (not Los Angeles Harbor). The second parties agree to pay therefor according to first party's list price at date of order, less the special discounts below mentioned. The first party, however, reserves the right to change its list prices at any time and in any particular, without notice, but after such time as the second parties have actual notice of the change in first party's list price, the second parties shall be entitled to make purchases hereunder to the amount of Five Thousand (\$5,000.00) Dollars at the old list price.

The first party shall not be obliged to accept, on any one day, orders from the second parties aggregating more than Five Thousand (\$5,000.00) Dollars.

For Pumps, the second parties agree to pay first party's list price at date when order is received by first party, less the special discount of twenty-five (25%) per cent from said list prices. Such list

prices shall, approximately, be the first party's retail selling price.

For Wire Wound Screen, the second parties agree to pay first party's list price at date when order is received by first party, less the special discounts of fifty (50%) per cent and twenty-five (25%) per cent from said list prices. Such list prices, less fifty (50%) per cent, shall, approximately, be first party's retail selling price.

For Shutter Screens, the second parties agree to pay first party's list price at date when order is received by first party, less the special discounts of twenty-five (25%) per cent and twenty-five (25%) per cent from said list prices. Such list prices, less twenty-five (25%) per cent, shall, approximately, be first party's retail selling price.

The above clauses reading in effect that "Such list prices shall, approximately, be first party's retail selling price," shall be construed as having been inserted into this contract for the purpose of insuring the second parties that first party will adhere to its present policy of selling its pump at list when it can, and its wire wound screens at list, less fifty (50%) per cent, when it can, and its shutter screens at list less twenty-five (25%) when it can, and when the first party cannot sell at these prices, then to sell as close to them as circumstances will admit. Said clauses are also inserted into this contract for the purpose of insuring the second parties that the first party will act in good faith and will not arbitrarily change its list prices for the sole purpose of closing the second parties off the market or of deliberately handicapping or abridging the second

parties' business contemplated hereunder. It is understood, however, that the first party's "list price," which is mentioned and referred to, and according to which the second parties will pay less the discounts mentioned, shall be its actual list price according to the ordinary commercial meaning of this term, and shall not be an average of its retail selling prices, or anything else like that. Also, the above quoted clauses shall not be construed as limiting the first party to sell its pumps at list, or its wire wound screens at list less fifty (50%) per cent, or its shutter screens at list less twenty-five (25%) per cent. The first party never has sold exactly at these prices, but has only endeavored to do so, and has sold as close to them as the circumstances of each particular case would admit, and it is not contemplated by either party that the execution of this contract shall require the first party to in any way change its policy concerning this relation between its list prices and its retail selling prices.

The first party shall make delivery promptly, but shall not be liable for any loss or damage whatever caused by accidents, fires, strikes, civil or military authority, or by insurrection or riot, or by any other cause beyond first party's control.

2.

If the second parties contract with one of their customers to furnish a pump, on condition that the customer may return it to them if the well in which it is to be installed does not furnish a specified amount of water, or that the customer may return it to them for any other reason previously stated by the second parties to the first party, and accepted



by the latter in writing, the second parties may state such condition or reason, and the particular amount of water specified, in their order for the pump from the first party, and if this has been done and the pump is returned to second parties on account of the well not furnishing the amount of water specified or on account of any of the other reasons previously agreed to in writing with the first party concerning that particular pump, then the second parties shall have the right to return such pump to the first party, provided it is delivered up at first party's factory in Los Angeles, free of all expense to first party, within ninety (90) days from the time when first party delivered it to second parties, unless the second parties have previously made special arrangements in writing with the first party, extending the time within which that pump may be returned. In event a pump is so returned, either within the ninety days, or within the time period covered by said special arrangements in writing, the second parties shall be allowed credit on such pump amounting to the invoice price thereof, less One (\$1.00) Dollar per foot for its total depth, but this minimum deduction of credit on any one pump shall be Fifty (\$50.00) Dollars. However, if first party's expenses in putting said pump in re-salable condition exceed the total deduction for credit computed as above, then the minimum deduction shall be first party's actual expenses incurred in this regard.

### 3.

On the fifteenth day of November, 1914, and on the fifteenth day of each and every month there-

after, the second parties shall deliver to first party a sixty (60) day, seven (7%) per cent note, signed by both of the second parties, and of bankable form satisfactory to the first party, covering all purchases and other indebtedness of whatever kind or form incurred by the second parties of the first part throughout the preceding calendar month, and all such notes shall be paid in cash at maturity. For this purpose, all delivery of pumps f.o.b. cars Los Angeles, as hereinbefore provided, shall be deemed a purchase on the part of the second parties, even tho the latter have a right to return the same under the provisions herein. However, the total credit which the first party will extend to the second parties, including all of the second parties' notes, open accounts, and all their other outstanding obligations whatever to first party, shall lie wholly within the discretion of first party, which shall have the right at any time to demand cash on delivery for further purchases made by second parties hereunder. However, if such demand for cash is made, and the same is paid upon delivery, the second parties shall be entitled to an additional discount of five (5%) per cent from the cash due.

For the guidance of the second parties in estimating the total amount of credit which may be anticipated under this contract, it is hereby certified that first party's Board of Directors has duly and formally passed the following resolution:

**RESOLVED:** That, under the contract this day authorized between this Corporation on the one side and Stanley M. Halstead and P. E. Vaughan on the other side, and contingent upon

a satisfactory statement signed by said Halstead and Vaughan, being delivered to first party, and showing that their net assets, over and above all their liabilities, reasonably amount to Twenty-five Thousand (\$25,000.00) Dollars, the Credit Department of this Corporation is hereby authorized to extend such credit as in its discretion may seem proper, but not to exceed Eleven Thousand (\$11,000.00) Dollars, unless authorization for credit in excess of this amount is first obtained from the Board of Directors. This total credit of Eleven Thousand (\$11,000.00) Dollars, shall include all notes, open accounts, and outstanding indebtedness of any sort whatever, due this Corporation under said contract, and also the indebtedness now due or owing to this Corporation from S. M. Halstead personally, but shall not include any indebtedness whatever which may arise between S. M. Halstead and this Corporation under the former's contract to purchase the well rig which has been heretofore delivered to him, nor shall it include the indebtedness which shall be incurred by the said S. M. Halstead and P. E. Vaughan on account of their taking over the automobiles or furnishings of this Corporation now used in conjunction with its San Francisco and San Jose offices. The taking over of said automobiles and furnishings, if at all, shall be under separate contract which shall provide the terms of payment.

## 4.

In event the second parties send in any orders

to be shipped them at points where there is no authorized Railroad agent to collect the freight, and the first party advances or prepays the freight thereon for the second parties, the second parties agree to remit in cash the amount of freight so advanced, within ten (10) days from the date when first party mails the second parties the freight bill covering the same. Money which has been thus advanced on freight shall not be left to go into the next sixty (60) day note mentioned in Provision 3, but shall be paid in accordance herewith. Also, it is understood that delivery shall be deemed to have been made by first party to second parties at Los Angeles as hereinbefore provided, and that at this point responsibility for the shipment shall cease in the first party.

5.

In consideration of the foregoing provisions, the second parties agree not to sell or use any other pumps, screens or perforated casings of whatsoever kind or form, in the building or equipping of wells, except the patented pumps and screens purchased of the first party in accordance herewith.

6.

It is mutually understood that the second party shall have the right to drill and equip wells complete anywhere throughout the States of California, Arizona, and New Mexico, provided the first party's pumps and screens are used exclusively throughout. The second parties shall also have the right to sell pumps for installation in wells drilled by other parties in California, north of the Thirty-fifth (35) Parallel, which line the parties agree to use as ex-

actly demarking the so-called **TEHACHAPI LINE** across California.

The second parties agree not to sell or furnish to others, screens delivered hereunder, for installation in wells to be drilled by other parties in Arizona or New Mexico, or in California south of the line just mentioned, and the second parties also agree not to sell or furnish pumps delivered hereunder, for installation in wells that other parties have drilled in Arizona or New Mexico, or in California south of said line. The second parties further guarantee that such screens or pumps shall not be used or installed in violation of this provision, in Arizona or New Mexico, or in California south of the line mentioned.

The second parties further guarantee that the patented pumps or screens furnished them hereunder, shall not be re sold or used outside of California, Arizona or New Mexico, unless the written license or authority for such re-sale or use has been first obtained from the party owning the patents thereon in the place where such re-sale or use is made.

7.

The second parties hereby acknowledge the validity of the following patents covering the above-mentioned Pumps and Screens, and which patents are owned by the first party in and throughout California, Arizona and New Mexico. The second parties also acquiesce in, and agree to acquiesce in said patents, throughout the life of each patent mentioned. This provision embraces and applies to the following patents:

Patent No. 750,206, dated Jan. 19th, 1904, to M. E.

Layne, for Wire Winding Tool.

Patent No. 805,211, dated Nov. 21st, 1905, to M. E. Layne, for Well Screen.

Patent No. 806,416, dated Dec. 5th, 1905, to M. E. Layne, for Screen Device.

Patent No. 820,507, dated May 15th, 1906, to M. E. Layne, for Wire Winding Machine.

Patent No. 821,653, dated May 29th, 1906, to M. E. Layne, for Well Mechanism.

Patent No. 1,001,655, dated Aug. 29th, 1911, to M. E. Layne, for Well Strainer.

Patent No. 1,079,679, dated Nov. 25th, 1913, to J. A. Wintroath, for Well Mechanism.

Patent No. (Re-issue) 13,467, dated Sept. 24th, 1912, to M. E. Layne, for Well Mechanism.

Concerning the above patents which cover the pump, the second parties agree that the term "enclosed line shaft," or the term "a closed casing surrounding the pump shaft from the pump to the top of the well," means and embraces any pump shaft for a deep well centrifugal pump, which is surrounded by a casing extending substantially from the pump to the top of the well and is provided with bearing parts for the shaft along its length, and which casing is sufficiently closed to allow the feeding of a lubricating fluid down thru said casing to the various bearing parts for the shaft therein.

8.

The second parties agree not to sell or use any of the patented screens furnished hereunder, for use in oil wells or in any other kind of wells except water wells, and the second parties guarantee that

such screens shall not eventually be used in oil wells in violation of this provision.

## 9.

The second parties enter upon this contract jointly and severally, and agree to be bound jointly and severally by each of its provisions. Furthermore, for the purposes of this contract, and for the giving of orders, the receiving of notices, and for the doing of anything which may arise in connection herewith, each of the second parties hereby appoints the other as his agent, so that both of them shall become jointly and severally bound by the acts or agreements of either in the course hereof, the same as tho they were partners.

## 10.

This contract shall not be assignable by the second parties, or either of them, unless the second parties first obtain the first party's written assent thereto, duly executed under the authority of the first party's Board of Directors.

## 11.

It is a specific condition, and part of the consideration, upon which the first party enters upon this contract, that the second parties shall abide strictly in each and every guarantee, condition, provision and part of a provision, contained throughout this contract, and any violation whatever of any such guarantee, condition, provision or part of a provision, shall entitle the first party to revoke and cancel this contract entirely, so that no business shall

thenceforth be done hereunder. In order to so cancel or revoke this contract, however, the first party shall give notice to that effect by registered letter mailed and addressed to either of the second parties at their last known address, within thirty (30) days from the time when first party first obtained knowledge of the breach or violation, and if such notice is not served within said thirty (30) days, the first party shall be deemed to have waived right to cancel or revoke this contract on account of that particular breach or violation. Upon the giving of such notice, the cancellation and revocation of this contract shall be immediate and complete, and no procedure whatever, either in law or equity, shall be required on the part of the first party, in order to cause such cancellation or revocation to take effect. If the contract is canceled or revoked, however, the same shall not effect or change in any manner, any liabilities previously created hereunder on either side.

12.

The life of this contract shall be for four years from the date hereof.

IN TESTIMONY WHEREOF the parties have caused these presents to be executed in duplicate, the day and year first above written, the first party signing its corporate name and affixing its seal thru its President and Secretary, thereunto duly author-



ized by its Board of Directors by resolution passed on the 7th day of October, 1914.

THE LAYNE AND BOWLER CORPORATION,

By P. D. BOWLER,  
President.

[Corporate Seal]

By W. E. BOWLER,  
Secretary,  
First Party.

S. M. HALSTEAD,  
P. E. VAUGHAN,  
Second Parties.

[Endorsed]: No. 485—Equity. Layne & Bowler Corpn. vs. Western Well Works et al. Plaintiff's Exhibit No. 3. Filed Sept. 3, 1920. W. B. Maling, Clerk. By J. A. Schaertzer, Deputy Clerk.

No. 3627. United States Circuit Court of Appeals for the Ninth Circuit. Filed Jan. 6, 1921. F. D. Monekton, Clerk.

**Defendants' Exhibit "A-1."**

[Endorsed]: In the United States District Court, Northern District of California, Southern Division. In Equity—No. 485. Layne & Bowler Corporation, Plaintiff, vs. Western Well Works, Inc., a Corporation, et al., Defendants. Defendants' Exhibit "A-1." Hattie B. Lehman, Notary Public.

Filed Sep. 2, 1920. W. B. Maling, Clerk. By J. A. Schaertzer, Deputy Clerk.

No. 3627. United States Circuit Court of Appeals for the Ninth Circuit. Filed Jan. 6, 1921. F. D. Monckton, Clerk.

No. 735,690.

PATENTED AUG. 11, 1903.

J. W. ALVORD.

MEANS FOR ALINING PUMP SHAFTS IN WELL CASINGS.

APPLICATION FILED NOV. 17, 1902.

NO MODEL

2 SHEETS—SHEET 1.

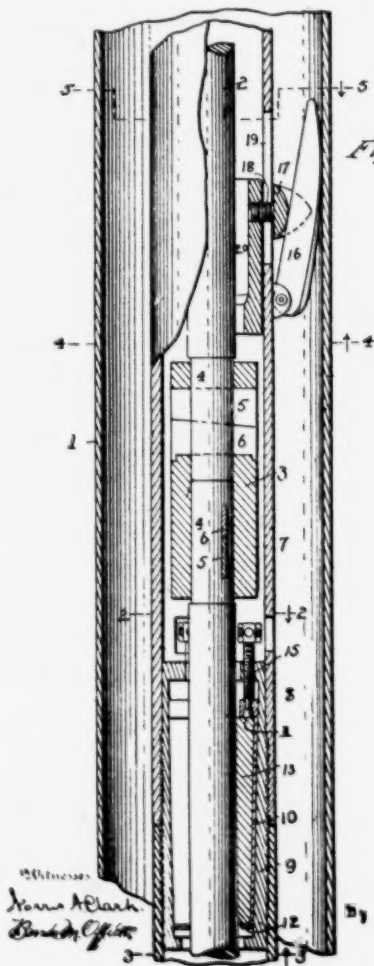


Fig. 1.

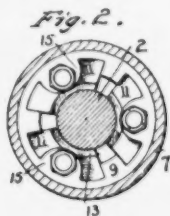


Fig. 2.

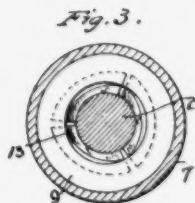


Fig. 3.

Witness:  
 Harry A. Clark  
 Bookkeeper

Witness:  
 John W. Alvord  
 J. W. Alvord  
 Attorney

No. 735,690.

PATENTED AUG. 11, 1903.

J. W. ALVORD.

MEANS FOR ALINING PUMP SHAFTS IN WELL CASINGS.

APPLICATION FILED NOV. 17, 1902.

NO MODEL

2 SHEETS—SHEET 2.

Fig. 4.

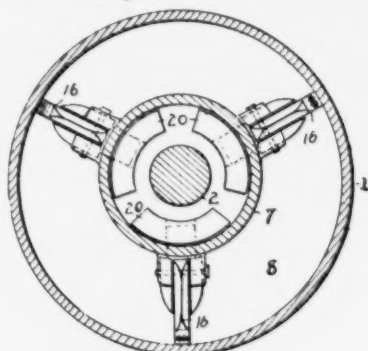
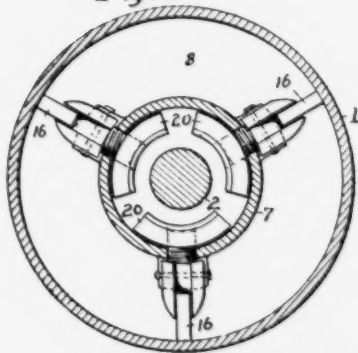


Fig. 5.



Inventor

John W. Alvord,  
J. W. Alvord & Co.  
Attorneys

Witnesses  
Louis A. Clark.  
Donald M. Offutt.

By

No. 735,690.

Patented August 11, 1903.

## UNITED STATES PATENT OFFICE.

JOHN WATSON ALVORD, OF CHICAGO, ILLINOIS.

## MEANS FOR ALINING PUMP-SHAFTS IN WELL-CASINGS.

SPECIFICATION forming part of Letters Patent No. 735,690, dated August 11, 1903.

Application filed November 17, 1902. Serial No. 131,663. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN WATSON ALVORD, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Means for Alining Pump-Shafts in Well-Casings; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to rotary pumps for deep wells; and its object is to provide means for automatically alining the pump-shaft.

The casing of a deep well, by which I mean a well having a depth of one hundred feet or more, is usually slightly crooked or sinuous, so that the shaft of a rotary pump located at or near the bottom of the well will not be equidistant from the casing throughout its entire length, but will be nearer to one side of the casing or the other at different points. It is of course necessary for the shaft to be absolutely straight in order to reduce the friction of the bearings to a minimum. My invention aims to keep the shaft perfectly straight, and yet support it rigidly in the casing by automatic alining devices.

In the accompanying drawings, Figure 1 is a longitudinal section of a portion of a well-casing, pump-shaft, and shaft-tube, with a shaft-bearing and a self-alining support for the tube. Figs. 2 and 3 are cross-sections at the lines 2 2 3 3, respectively, on a slightly larger scale. Fig. 4 is a cross-section at the line 4 4 on a still larger scale and showing the tube eccentric to the casing. Fig. 5 is a cross-section on the same scale at the line 5 5, showing the tube and casing concentric.

The well-casing 1 is a metal pipe of suitable diameter and circular in cross-section. It may or may not be perfectly straight throughout its entire length. The rotary pump (not shown) is located at the bottom of the well and is driven by a vertical shaft 2, rotated by any suitable means. (Not shown.) The shaft is made in suitable lengths united by rigid couplings, comprising, preferably, a sleeve 3, fitting the reduced ends 4 of the

shaft-sections, and fastened by the transverse keys 5 and cotters 6. The shaft is inclosed in a shaft-tube 7, made in suitable lengths coupled together and considerably less in diameter than the well-casing, so as to leave an annular space 8 between them for the water to flow up through. At suitable points in the tube are bearings for the shaft, consisting, preferably, of a bushing 9, rigidly secured in the tube, as by the screw-threads shown, and slightly tapered internally. Segmental carriers 10 are placed in the bushing, having flanges 11 12 at each end to confine the segmental bearing-blocks 13, which are preferably made of lignum-vitæ and fit the shaft closely. Adjusting-screws 14 are swiveled in the flanges 11 and mesh with tapped holes in lugs 15 on the adjacent end of the bushing, so by turning the screws the carriers and their blocks can be slid lengthwise in the tapering bushing, and thus be set in or out to fit the shaft. The heads of the screws are accessible through holes in the tube.

Hinged to the outside of the shaft-tube, at points adjacent to the upper end of the sleeve 3, are a plurality of braces 16, preferably sharpened along their under edges to reduce the resistance to the rising column of water. The braces extend upwardly, and as each brace is independently hinged it will naturally fall outward in a radial plane until its end rests against the inside of the well-casing. If the shaft-tube happens to be eccentric to the casing at that point, as shown in Fig. 4, the braces will stand at different angles. Means are provided for locking each brace independently in whatsoever position it assumes, so that the tube will be rigidly supported in the casing whether it is concentric or eccentric therewith. The locking device which I prefer consists of a wedge or chock 17, preferably forked and fitting against the outside of the shaft tube and having a shank 18 sliding in a longitudinal slot 19 in said tube behind the brace. Inside the tube is a segmental weight 20, fastened to the shank and causing the chock to drop until it wedges in the angular space between the tube and the back of the brace. In this position of the chock the brace is rigidly held against inward movement, and the coöperation of the several braces supports the tube firmly

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against any lateral displacement. To release the braces when the tube is to be raised or lowered in the casing, the shaft is so constructed and arranged as to be capable of an upward lengthwise movement sufficient to bring the upper end of the sleeve 3 against the lower ends of the segmental weights 20 and lift them and the chocks, thus unlocking the braces and leaving them free to move in and out as they slide up or down in the casing with the tube. When said tube has been relocated, the shaft is dropped, and the chocks again fall into place and lock the braces in whatsoever position they may happen to be.

It is thus evident that my invention provides means for automatically aligning a pump-shaft in a well-casing whether the latter is straight or crooked.

It will be understood that a plurality of aligning devices and locking and unlocking means will be provided, according to the length of the shaft.

Having thus described my invention, what I claim is—

1. The combination with a well-casing, of a straight rotary pump-shaft therein, and a plurality of independent, automatic adjusting devices located between the shaft and the casing, whereby said shaft is automatically braced in proper alinement irrespective of any deviation of said casing from a straight line.

2. The combination with a well-casing, of a straight rotary pump-shaft therein, bearings for said shaft, and a plurality of automatic, independently-adjustable devices serving to brace said bearings automatically in proper alinement in said casing, irrespective of any deviation of said casing from a straight line.

3. The combination with a well-casing, of a straight rotary pump-shaft therein, a tube inclosing said shaft, bearings in said tube, and a plurality of automatic, independently-adjustable devices between said tube and casing, whereby the former is automatically braced in proper alinement irrespective of any deviations of the latter from a straight line.

4. The combination with a well-casing, of a rotary pump-shaft therein, a tube inclosing said shaft, bearings in said tube, braces between said tube and casing, and means for adjusting said braces independently of each other.

5. The combination with a well-casing, of a rotary pump-shaft therein, a tube inclosing said shaft, bearings in said tube, braces between said tube and casing, and means for adjusting and locking each brace independently.

6. The combination with a well-casing, of a rotary pump-shaft therein, a tube inclosing said shaft, bearings for said shaft, braces between said tube and casing, means for locking each brace independently, and means for unlocking said braces simultaneously.

7. The combination with a well-casing, of a rotary pump-shaft therein, a tube inclosing said shaft, bearings in said tube, braces hinged to said tube, and means for locking said braces.

8. The combination with a well-casing, of a rotary pump-shaft therein, a tube inclosing said shaft, bearings in said tube, braces hinged to said tube, and a choke for wedging each brace.

9. The combination with a well-casing of a rotary pump-shaft therein, a tube inclosing said shaft, bearings in said tube, braces hinged to said tube, a choke for wedging each brace, and means for lifting said chocks.

10. The combination with a well-casing, of a rotary pump-shaft therein, a tube inclosing said shaft, bearings in said tube, braces hinged to said tube, and a choke for each brace having a shank projecting into said tube and adapted to be lifted by an upward movement of the pump-shaft.

11. The combination with a well-casing, of a rotary pump-shaft therein, a tube inclosing said shaft, bearings in said tube, braces hinged to said tube, a choke for wedging each brace having a shank projecting into said tube, and a weight secured to said shank.

12. The combination with a well-casing, of a rotary pump-shaft therein having a sleeve thereon, a tube inclosing said shaft and having longitudinal slots therein, braces hinged to said tube, a choke for wedging each brace having a shank projecting through a slot, and a weight secured to said shank inside said tube and adapted to be lifted by said sleeve when said shaft is lifted.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN WATSON ALVORD.

Witnesses:

ROBERT O. HARPER.  
FRED G. WILBER.

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**Defendants' Exhibit "A-2."**

[Endorsed]: In the United States District Court, Northern District of California, Southern Division. In Equity—No. 485. Layne & Bowler Corporation, Plaintiff, vs. Western Well Works, Inc., a Corporation, et al., Defendants. Defendants' Exhibit A-2. Hattie B. Lehman, Notary Public.

Filed Sep. 2, 1920. W. B. Maling, Clerk. By J. A. Schaertzer, Deputy Clerk.

No. 3627. United States Circuit Court of Appeals for the Ninth Circuit. Filed Jan. 6, 1921. F. D. Monckton, Clerk.

vs. Layne & Bowler Corporation.

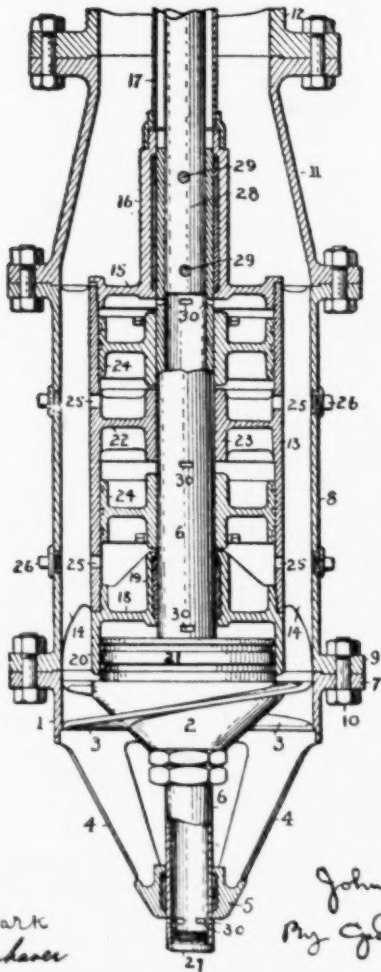
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No. 755,691.

PATENTED AUG. 11, 1903.

J. W. MOVORD.  
HIGH SPEED ROTARY PUMP.  
APPLICATION FILED DEC. 24, 1901.

NO. 1000.



Witnesses  
Norris A. Clark  
Geo. M. Copeland

John W. Alvord  
By G. B. Whitman  
Attorney



## UNITED STATES PATENT OFFICE.

JOHN WATSON ALVORD, OF CHICAGO, ILLINOIS.

## HIGH-SPEED ROTARY PUMP.

SPECIFICATION forming part of Letters Patent No. 735,691, dated August 11, 1904.

Application filed December 24, 1902. Serial No. 136,465. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN WATSON ALVORD, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in High-Speed Rotary Pumps; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawing, and to the figures of reference marked thereon, which forms a part of this specification.

This invention relates to centrifugal pumps, and especially to those that are run at high speeds and lift water from deep wells, by which I mean wells a hundred feet or more in depth. In such wells the pump is located far below the surface of the ground and rotates in a horizontal plane, the shaft extending to the surface, where it is connected to a suitable motor. The weight of this upright shaft and the other rotating parts, together with the superimposed water column, is very great, and it is a serious problem to guide and support the shaft. In another application recently filed I have set forth means for maintaining such a shaft in proper alignment. The present invention has to do with the supporting of the superimposed water column, the shaft, and other rotating parts.

It has been proposed to balance the weight of such shafts and superimposed water column by the pressure of the water column in the uptake or delivery pipe.

My invention consists in certain novel constructions and arrangements of parts whereby this result can be effectively accomplished and automatically regulated. The shaft is journaled in bearings which permit it to have a certain amount of lengthwise play. Secured to the shaft is one or more pistons, which fits or fit in a cylindrical portion or portions of the stationary pump-casing and each forms one end of a chamber. The under side of the piston is exposed to the pressure of the water column in the uptake, while its upper side is subjected to the pressure in the chamber. There is an outlet from the chamber to the suction side of the pump, and this outlet is controlled by the lengthwise play of the shaft,

closing gradually as the shaft rises and opening when it falls. As there is a constant small leakage past the piston into the chamber, the pressure in said chamber tends to gradually increase, thus lessening the effective upward pressure on the under side of the piston. The shaft therefore moves slowly downward until it causes the outlet to open and relieve the pressure in the chamber, whereupon the fall of the shaft is checked. Thus by a series of constant adjustments and readjustments of the relative pressures on the two sides of the piston the differential pressure tending to lift the shaft is kept approximately constant, so that the shaft remains floating on the water column in substantially a constant position irrespective of the fluctuations in the actual pressure of the water column.

This invention is applicable to pumps having a great variety of impellers and can be carried out in many different ways. The accompanying drawing illustrates one mode of applying it to a rotary pump having a plain screw-impeller, the view being a longitudinal section of the pump.

The casing of the pump is made in sections, the lower section 1 being cylindrical to snugly inclose the impeller, which has a conical body 2 and helical blades 3, by means of which the water is given an upward motion when the impeller is rotated. The section 1 has depending arms 4, supporting the lower bearing 5 for the impeller-shaft 6. This section also has a flange 7, on which is mounted the preferably cylindrical body-section 8 by means of the flanges 9 and bolts 10. The upper section 11 is preferably conical and is fastened to the top of the body-section 8 and also to the lower end of the uptake or delivery pipe 12, preferably by the flanges and bolts shown. The body-section has a concentric inner shell 13, preferably united with the outer shell by radial webs 14, cast integral with both shells. The inner shell is provided at each end with a head, the upper one 15 carrying a bearing 16 for the impeller-shaft and also supporting the lower end of the shaft-casing 17. The lower head 18 has a bearing 19 for the impeller-shaft and also a cylindrical flange 20, inclosing a piston 21, on said shaft just above the body of the impeller and

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ly less in diameter than said body. A way of the inner shell is a diaphragm 22, which is a bearing 23 for the shaft 6. This diaphragm divides the shell into two chambers, in each of which is a piston 24, secured to the shaft 6 and fitting the inside of the shell. Below each piston one or more holes are made in the shell, preferably by drilling through both shells, the holes in the outer shell being afterward closed by screw-plugs 25. It is evident that more than two chambers and pistons may be used, if desired.

The impeller-shaft 6 is tubular, its lower end being closed by a screw-plug 27, while its upper end is closed by the inwardly-projecting lower end of the pump-shaft 28, which fits in the shaft 6 and is secured thereto by transverse pins 29. The pump-shaft is preferably provided to give a maximum torsional strength. The ports 30 are cut at suitable points in the impeller-shaft just below the lower bearing 5 and the bearings 16, 19, and 23.

The operation of the pump is as follows: The impeller is rotated at high speed and forces the water up through the annular space between the outer and inner shells of the body-section 8 of the casing. The water passes freely through the holes 25, and the pressure due to the weight of the rising water column in the uptake-pipe is thus transmitted to the under side of the pistons 24. By properly proportioning the area and number of said pistons to the total weight of the rotating parts and the superimposed water column said weight can be balanced by the lift on the pistons. Hence no step-bearing is required for the shaft. There is a little leakage of water past the pistons into the chambers above them, and this water in time fills the chambers. In order to prevent it from acquiring a pressure equal to that on the under side of the pistons, and thus neutralizing the lifting effect of the water column, the ports 30 are so arranged with reference to the stationary shaft-bearings that when the pressure in the chambers reaches a predetermined limit the consequent drop of the shaft will bring said ports below said bearings, thus permitting the water in the chambers to enter the tubular shaft and escape through the lower ports into the well on the suction side of the impeller. By closing the lower end of the shaft and providing the lower set of ports to form an intermediate chamber between the casing and the well, and thus prevent too sudden changes of pressure in the chambers; but as soon as sufficient water has escaped to permit the resultant increased pressure on the under side of the piston to lift the pistons and shaft the ports will be closed and the equilibrium reestablished. The shaft, pistons, and impeller thus have a constant slight motion up and down as these adjustments of pressure occur. It will be noticed that they are independent of the actual pressure in pounds per square inch, since the balancing effect is due to the dif-

ferential pressure on the under side of the piston and not to the actual pressure of the water column. It will also be noticed that 70 by means of the piston 21 and its chamber and escape-ports the area of the impeller subjected to a downward pressure is no greater than that of its blades and that this is partially balanced by the upward pressure of 75 the water column on so much of the conical body of the impeller as lies above the blades.

I am aware that it has been proposed to provide the shaft of a rotary pump with a balancing piston and to utilize the water leaking past said piston to lubricate the adjacent shaft-bearing; but my invention aims to utilize the leakage to set up a differential pressure on the under side of the piston, so as to automatically balance the rotating parts 85 respectively of the height of the water column—a result not possible in the aforesaid proposed construction.

I claim—

1. In a rotary pump, the combination with 90 an upright axially-movable shaft, of a balancing-piston secured thereto and having its under side exposed to the pressure of the water column, a stationary casing containing a chamber above said piston, and means con- 95 trolled by the axial movement of the shaft for permitting the escape of water from said chamber to the suction side of the pump, and thus regulating the pressure in said chamber.

2. In a rotary pump, the combination with 100 an upright axially-movable shaft, of a stationary casing containing a chamber concentric with said shaft and having means to admit the pressure of the water column in the uptake, a piston secured to said shaft and 105 fitting the walls of said chamber, and escape-ports above said piston controlled by the axial movement of said shaft.

3. In a rotary pump, the combination with an upright axially-movable tubular shaft, of 110 a stationary casing containing a chamber concentric with said shaft and having holes in its walls, a piston secured to said shaft and fitting the walls of said chamber above said holes, and escape-ports in said shaft above 115 said pistons.

4. In a rotary pump, the combination with an upright axially-movable tubular shaft, of a stationary casing comprising two concentric shells, the inner one being closed at the 120 top and bottom and having holes in its walls, one or more pistons in said inner shell above said holes and secured to said shaft, and escape-ports in said shaft above said pistons, controlled by the axial movement of said 125 shaft.

5. In a rotary pump, the combination with an upright axially-movable tubular shaft, of a stationary casing, comprising two concentric shells, the inner one having a diaphragm 130 and provided with holes in its walls above and below said diaphragm, heads closing the top and bottom of said inner shell, shaft-bearings in said heads and diaphragm, pistons

secured to said shaft above said holes, and escape-ports in said shaft adjacent to the lower ends of said bearings.

5 6. In a rotary pump, the combination with an axially-movable tubular shaft having its lower end closed and provided with ports, of a bearing adjacent to and above said ports, a balancing-piston secured to said shaft and having its under side exposed to the pressure  
10 of the water column, a stationary casing containing a chamber for said piston, and means for putting said chamber in communication with the interior of said shaft when the resultant pressure on the under side of the pis-  
15 ton falls below a predetermined limit.

7. In a rotary pump, the combination with a stationary casing comprising two concentric shells, of a shaft concentric with said shells, an impeller on the shaft having a con-  
20 ical body carrying a piston fitting a chamber at the lower end of the inner shell, means for

permitting the escape of leakage-water from said chamber to the suction side of the pump, and a balancing-piston in the inner shell exposed underneath to the pressure of the water column and above to the pressure in a chamber in said shell.

8. In a rotary pump, the combination with a stationary pump-casing, of an impeller, in shaft, a balancing-piston secured on the shaft, a casing surrounding said piston and communicating below the piston with the uptake, and means for automatically regulating the pressure on the top of the piston, whereby the differential pressure on its under side will remain substantially constant.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN WATSON ALVORD.

Witnesses:

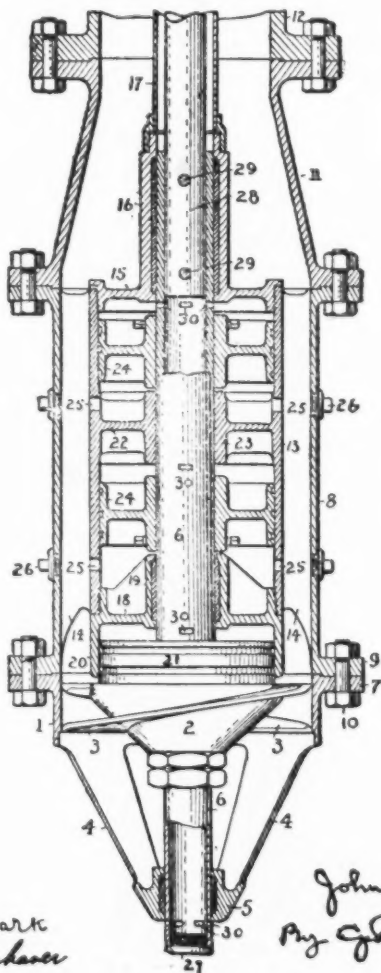
ARTHUR McLEAN,  
CHAS. B. BURDICK.

Dr. 785,831.

PATENTED AUG. 11, 1902.

J. W. ALVORD.  
HIGH SPEED ROTARY PUMP.  
APPLICATION FILED DEC. 24, 1902.

NO. 1111111



Witnessed

Horris A. Clark  
Geo. M. Carpenter

Subscribed

John W. Alvord  
By *G. M. Carpenter*  
Attorney

## UNITED STATES PATENT OFFICE.

JOHN WATSON ALVORD, OF CHICAGO, ILLINOIS.

## HIGH-SPEED ROTARY PUMP.

SPECIFICATION forming part of Letters Patent No. 735,691, dated August 11, 1903.

Application filed December 24, 1902. Serial No. 136,465. (No model.)

*To all who mit may concern:*

Beit known that I, JOHN WATSON ALVORD, a citizen of the United States, residing at Chicago, in the County of Cook and State of Illinois, have invented certain new and useful Improvements in High-Speed Rotary Pumps; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawing, and to the figures of reference marked thereon, which forms a part of this specification.

This invention relates to centrifugal pumps, and especially to those that are run at high speeds and lift water from deep wells, by which I mean wells a hundred feet or more in depth. In such wells the pump is located far below the surface of the ground and rotates in a horizontal plane, the shaft extending to the surface, where it is connected to a suitable motor. The weight of this upright shaft and the other rotating parts, together with the superimposed water column, is very great, and it is a serious problem to guide and support the shaft. In another application recently filed I have set forth means for maintaining such a shaft in proper alignment. The present invention has to do with the supporting of the superimposed water column, the shaft, and other rotating parts.

It has been proposed to balance the weight of such shafts and superimposed water column by the pressure of the water column in the uptake or delivery pipe.

My invention consists in certain novel constructions and arrangements of parts whereby this result can be effectively accomplished and automatically regulated. The shaft is journaled in bearings which permit it to have a certain amount of lengthwise play. Secured to the shaft is one or more pistons, which fits or fit in a cylindrical portion or portions of the stationary pump-casing and each forms one end of a chamber. The under side of the piston is exposed to the pressure of the water column in the uptake, while its upper side is subjected to the pressure in the chamber. There is an outlet from the chamber to the suction side of the pump, and this outlet is controlled by the lengthwise play of the shaft,

closing gradually as the shaft rises and opening when it falls. As there is a constant small leakage past the piston into the chamber, the pressure in said chamber tends to gradually increase, thus lessening the effective upward pressure on the under side of the piston. The shaft therefore moves slowly downward until it causes the outlet to open and relieve the pressure in the chamber, whereupon the fall of the shaft is checked. Thus by a series of constant adjustments and readjustments of the relative pressures on the two sides of the piston the differential pressure tending to lift the shaft is kept approximately constant, so that the shaft remains floating on the water column in substantially a constant position irrespective of the fluctuations in the actual pressure of the water column.

This invention is applicable to pumps having a great variety of impellers and can be carried out in many different ways. The accompanying drawing illustrates one mode of applying it to a rotary pump having a plain screw-impeller, the view being a longitudinal section of the pump.

The casing of the pump is made in sections, the lower section 1 being cylindrical to snugly inclose the impeller, which has a conical body 2 and helical blades 3, by means of which the water is given an upward motion when the impeller is rotated. The section 1 has depending arms 4, supporting the lower bearing 5 for the impeller-shaft 6. This section also has a flange 7, on which is mounted the preferably cylindrical body-section 8 by means of the flanges 9 and bolts 10. The upper section 11 is preferably conical, and is fastened to the top of the body section 8 and also to the lower end of the uptake or delivery pipe 12, preferably by the flanges and bolts shown. The body-section has a concentric inner shell 13, preferably united with the outer shell by radial webs 14, cast integral with both shells. The inner shell is provided at each end with a head, the upper one 15 carrying a bearing 16 for the impeller-shaft and also supporting the lower end of the shaft-casing 17. The lower head 18 has a bearing 19 for the impeller-shaft and also a cylindrical flange 20, inclosing a piston 21, on said shaft just above the body of the impeller and

735,691

ly less in diameter than said body. away of the inner shell is a diaphragm 22, which is a bearing 23 for the shaft 6. This diaphragm divides the shell into two chambers, in each of which is a piston 24, secured to the shaft 6 and fitting the inside of the shell. Below each piston one or more holes are made in the shell, preferably by drill, through both shells, the holes in the outer shell being afterward closed by screw-plugs.

It is evident that more than two chambers and pistons may be used, if desired.

The impeller-shaft 6 is tubular, its lower end being closed by a screw-plug 27, while its upper end is closed by the inwardly-projecting lower end of the pump-shaft 28, which fits in shaft 6 and is secured thereto by transverse pins 29. The pump-shaft is preferably made to give a maximum torsional strength. The ports 30 are cut at suitable points in the impeller-shaft just below the lower bearing 5 and the bearings 16, 19, and 23.

The operation of the pump is as follows: The impeller is rotated at high speed and raises the water up through the annular space between the outer and inner shells of the body-section 8 of the casing. The water issues freely through the holes 25, and the pressure due to the weight of the rising water column in the uptake-pipe is thus transmitted to the under side of the pistons 24. By properly proportioning the area and number of said pistons to the total weight of the rotating parts and the superimposed water column said weight can be balanced by the lift on the pistons. Hence no stop-bearing is required for the shaft. There is a little leakage of water past the pistons into the chambers above them, and this water in time fills the chambers. In order to prevent it from acquiring a pressure equal to that on the under side of the pistons, and thus neutralizing the lifting effect of the water column, the ports 30 are so arranged with reference to the stationary shaft-bearings that when the pressure in the chambers reaches a predetermined limit the consequent drop of the shaft will bring said ports below said bearings, thus permitting the water in the chambers to enter the tubular shaft and escape through the lower ports into the well on the suction side of the impeller. By closing the lower end of the shaft and providing the lower set of ports I form an intermediate chamber between the casing and the well, and thus prevent too sudden changes of pressure in the chambers; but as soon as sufficient water has escaped to permit the resultant increased pressure on the under side of the piston to lift the pistons and shaft the ports will be closed and the equilibrium reestablished. The shaft, pistons, and impeller thus have a constant slight motion up and down as these adjustments of pressure occur. It will be noted that they are independent of the actual pressure in pounds per square inch, since the balancing effect is due to the dif-

ferential pressure on the under side of the piston and not to the actual pressure of the water column. It will also be noticed that 70 by means of the piston 21 and its chamber and escape-ports the area of the impeller subjected to a downward pressure is no greater than that of its blades and that this is partially balanced by the upward pressure of 75 the water column on so much of the conical body of the impeller as lies above the blades.

I am aware that it has been proposed to provide the shaft of a rotary pump with a balancing-piston and to utilize the water leak- 80 ing past said piston to lubricate the adjacent shaft-bearing; but my invention aims to utilize the leakage to set up a differential pressure on the under side of the piston, so as to automatically balance the rotating parts irre- 85 spectively of the height of the water column—a result not possible in the aforesaid proposed construction.

I claim—

1. In a rotary pump, the combination with 90 an upright axially-movable shaft, of a balancing-piston secured thereto and having its under side exposed to the pressure of the water column, a stationary casing containing a chamber above said piston, and means con- 95 trolled by the axial movement of the shaft for permitting the escape of water from said chamber to the suction side of the pump, and thus regulating the pressure in said chamber.

2. In a rotary pump, the combination with 100 an upright axially-movable shaft, of a stationary casing containing a chamber concentric with said shaft and having means to admit the pressure of the water column in the uptake, a piston secured to said shaft and fitting the walls of said chamber, and escape- 105 ports above said piston controlled by the axial movement of said shaft.

3. In a rotary pump, the combination with an upright axially-movable tubular shaft, of 110 a stationary casing containing a chamber concentric with said shaft and having holes in its walls, a piston secured to said shaft and fitting the walls of said chamber above said holes, and escape-ports in said shaft above 115 said pistons.

4. In a rotary pump, the combination with an upright axially-movable tubular shaft, of a stationary casing comprising two concentric shells, the inner one being closed at the 120 top and bottom and having holes in its walls, one or more pistons in said inner shell above said holes and secured to said shaft, and escape-ports in said shaft above said pistons, controlled by the axial movement of said 125 shaft.

5. In a rotary pump, the combination with an upright axially-movable tubular shaft, of a stationary casing comprising two concentric shells, the inner one having a diaphragm 130 and provided with holes in its walls above and below said diaphragm, heads closing the top and bottom of said inner shell, shaft-bearings in said heads and diaphragm, pistons

secured to said shaft above said holes, and escape-ports in said shaft adjacent to the lower ends of said bearings.

5 6. In a rotary pump, the combination with an axially-movable tubular shaft having its lower end closed and provided with ports of a bearing adjacent to and above said ports, a balancing-piston secured to said shaft and having its under side exposed to the pressure  
10 of the water column, a stationary casing containing a chamber for said piston, and means for putting said chamber in communication with the interior of said shaft when the resultant pressure on the under side of the piston falls below a predetermined limit.

15 7. In a rotary pump, the combination with a stationary casing comprising two concentric shells, of a shaft concentric with said shells, an impeller on the shaft having a conical body carrying a piston fitting a chamber at the lower end of the inner shell, means for

permitting the escape of leakage-water from said chamber to the suction side of the pump, and a balancing-piston in the inner shell exposed underneath to the pressure of the water column and above to the pressure in a chamber in said shell.

8. In a rotary pump, the combination with a stationary pump-casing, of an impeller, its shaft, a balancing-piston secured on the shaft, a casing surrounding said piston and communicating below the piston with the uptake, and means for automatically regulating the pressure on the top of the piston, whereby the differential pressure on its under side will remain substantially constant.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN WATSON ALVORD.

Witnesses:

ARTHUR McLEAN,  
CHAS. B. BURDICK.

**Defendants' Exhibit "A-3."**

[Endorsed]: In the United States District Court, Northern District of California, Southern Division. In Equity—No. 485. Layne & Bowler Corporation, Plaintiff, vs. Western Well Works, Inc., a Corporation, et al., Defendants. Defendants' Exhibit "A-3." Hattie B. Lehman, Notary Public.

Filed Sep. 2, 1920. W. B. Maling Clerk. By J. A. Schaertzer, Deputy Clerk.

No. 3627. United States Circuit Court of Appeals for the Ninth Circuit. Filed Jan. 6, 1921. F. D. Monckton, Clerk.





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# **CARD 11**

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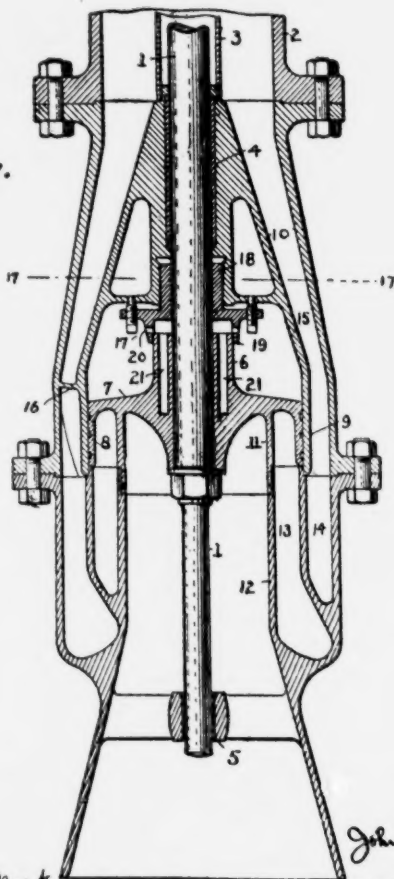
PATENTED AUG. 11, 1903.

J. W. ALVORD.  
HIGH SPEED ROTARY PUMP.  
APPLICATION FILED MAR. 20, 1903.

NO MODEL

8 SHEETS—SHEET 1.

Fig. 1.



Witnesses  
James A. Elger,  
Richard H. Hughes.

J.W.

Inventor  
John W. Alvord,  
C. J. Whitney  
Attorney

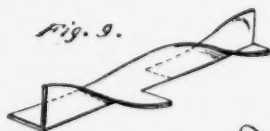
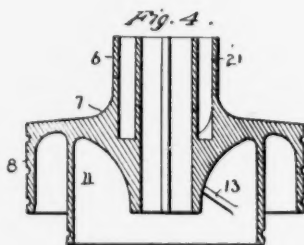
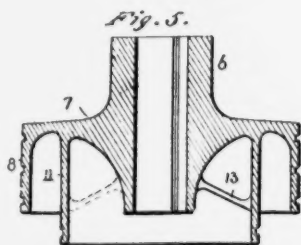
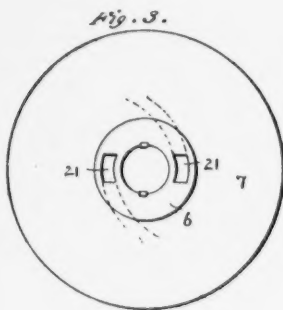
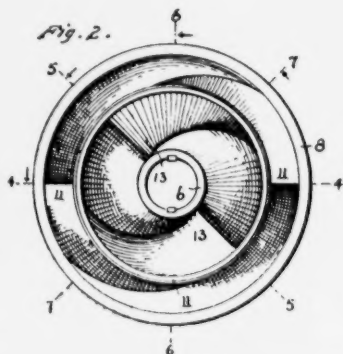
No. 735,692.

PATENTED AUG. 11, 1903.

J. W. ALVORD.  
HIGH SPEED ROTARY PUMP  
APPLICATION FILED MAR. 30, 1903.

NO MODEL.

8 SHEETS—SHEET 2.



Witness  
James A. Clark  
Richard W. Tucker

Inventor  
John W. Alvord  
Geo. W. Alvord  
Attorney

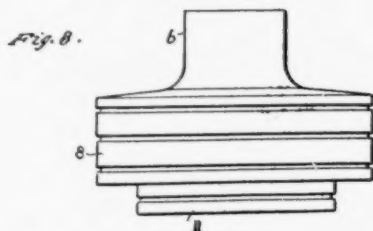
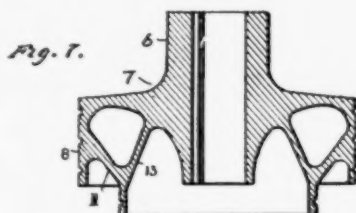
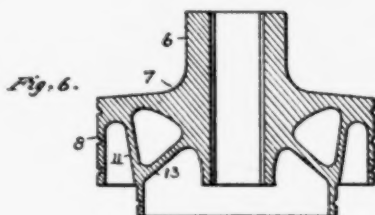
No. 735,692.

PATENTED AUG. 11, 1903.

J. W. ALVORD.  
HIGH SPEED ROTARY PUMP.  
APPLICATION FILED MAR. 30, 1903.

NO MODEL

9 SHEETS—SHEET 3.



Witnesses

James A. Clark.  
Richard W. Clark.

By

Inventor  
John W. Alvord  
J. W. Alvord  
Attorney

vs. Layne & Bowler Corporation.

947

No. 735,692

PATENTED AUG. 11, 1903.

J. W. ALVORD.  
HIGH SPEED ROTARY PUMP.  
APPLICATION FILED MAR. 30, 1903.

NO MODEL

2 SHEETS—SHEET 4.

Fig. 10.

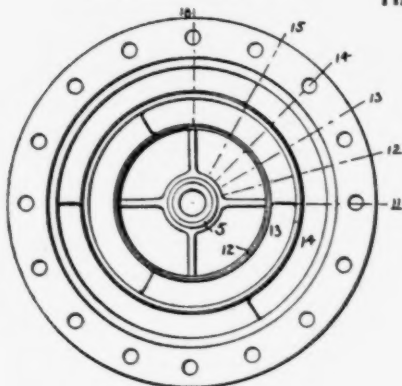
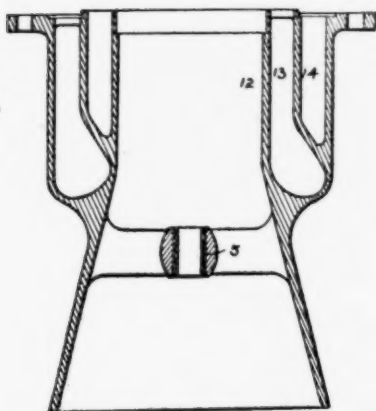


Fig. 11.



Inventor

John W. Alvord,

Attorney

Witnesses

Richard H. Clark  
Richard H. Clark

24,

No. 735,692.

PATENTED AUG. 11, 1903.

J. W. ALVORD.  
HIGH SPEED ROTARY PUMP.  
APPLICATION FILED MAR. 30, 1903.

NO MODEL.

9 SHEETS—SHEET 9.

Fig. 12.

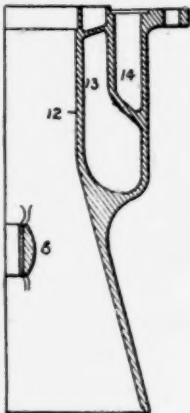


Fig. 13.

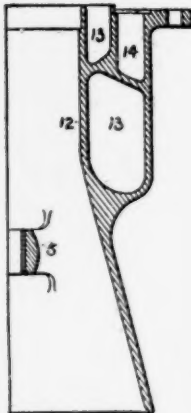


Fig. 14.

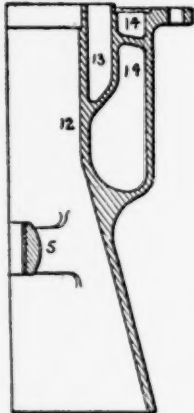


Fig. 15.

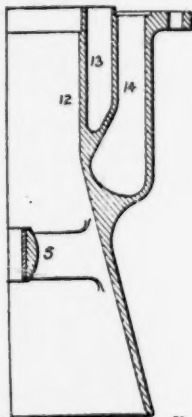
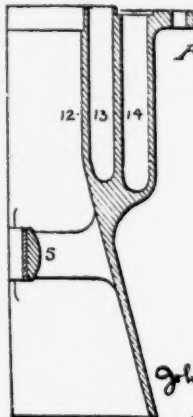


Fig. 16.



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James A. Day & Co.  
Richard H. Cropper

Fig. 1

Inventor

John W. Alvord

Geo. W. Whittey  
Attorney

No. 735,692.

PATENTED AUG. 11, 1903.

J. W. ALVORD.  
HIGH SPEED ROTARY PUMP.  
APPLICATION FILED MAR. 30, 1903.

NO MODEL

8 SHEETS—SHEET 6

Fig. 17.

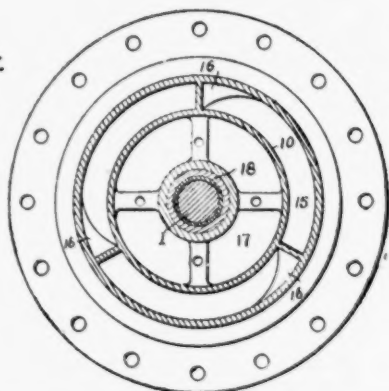


Fig. 18.

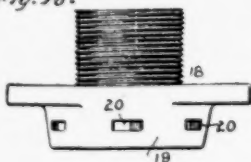


Fig. 19.

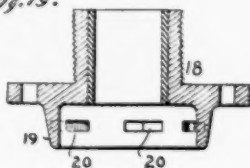
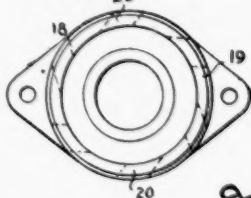


Fig. 20.



Inventor

John W. Alvord,  
Gustavus W. Alvord

Witnesses

Monie A. Elger,  
Richard W. Elger

209

No. 735,692.

PATENTED AUG. 11, 1903.

J. W. ALVORD.  
HIGH SPEED ROTARY PUMP.  
APPLICATION FILED MAR. 30 1903.

NO MODEL

8 SHEETS—SHEET 1

Fig. 21.

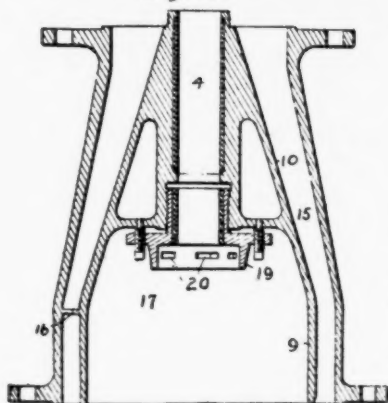


Fig. 23.

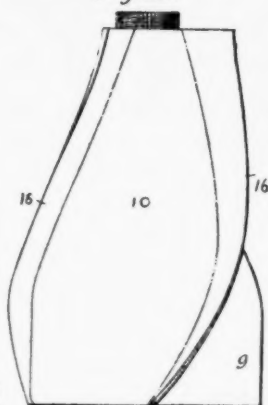


Fig. 22.

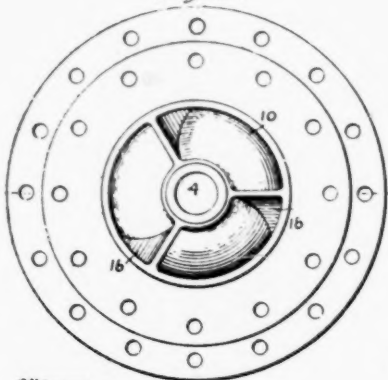
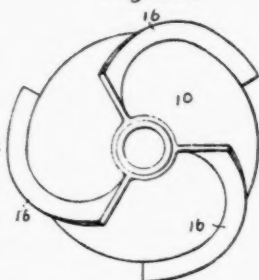


Fig. 24.



Witnesses  
James A. Clark  
Richard W. Cooper

Inventor  
John W. Alvord  
G. W. Whitney  
Attorney



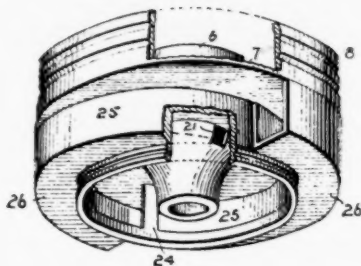
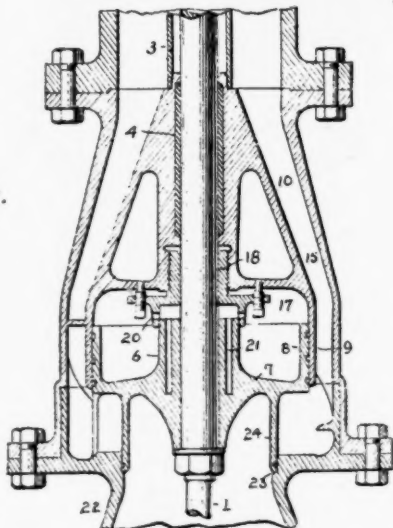
No. 735,692.

PATENTED AUG. 11, 1903.

J. W. ALVORD.  
HIGH SPEED ROTARY PUMP.  
APPLICATION FILED MAR. 30, 1903.

NO MODEL

• ENCLTS-SHEET 3.



September

John W. Alvord  
Geo. Whitney

<sup>29</sup>Sturges 2382.

Morris A. Clark  
 Richard H. Tucker

254

No. 735,692.

Patented August 11, 1903.

## UNITED STATES PATENT OFFICE.

JOHN WATSON ALVORD, OF CHICAGO, ILLINOIS.

## HIGH-SPEED ROTARY PUMP.

SPECIFICATION forming part of Letters Patent No. 735,692, dated August 11, 1903.

Application filed March 30, 1903. Serial No. 150,184. (No model.)

## To all whom it may concern:

Be it known that I, JOHN WATSON ALVORD, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in High-Speed Rotary Pumps; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which forms a part of this specification.

This invention relates to high-speed rotary pumps for deep wells, by which I mean wells a hundred feet or more in depth. In such wells the rotary pump is located far below the surface of the ground, being operated by an upright shaft rising to the surface and there driven by some suitable motor. In deep wells the weight of this long shaft and its attached parts is very great, and many schemes have been proposed for supporting it or for counterbalancing it.

My invention relates to that mode of counterbalancing which utilizes the hydrostatic pressure of the rising column of water in the uptake or delivery-pipe of the pump. In order to cause this column to exert a lifting effect upon the shaft and its attached parts, I so construct the impeller that the water column is reversed in direction in passing through the impeller, so that at the point where the water leaves the impeller it is flowing downward, being subsequently reversed again in passing through the impeller-casing, so as to thereafter pursue an upward course into the uptake. The hydrostatic reaction on the impeller at the point of delivery therefrom is sufficient to lift and sustain all the rotating parts. In order to automatically regulate the lifting effect within predetermined limits, so as to maintain the shaft and impeller in substantially the same position while running, I provide above the impeller a chamber into which the water under pressure can leak past the periphery of the impeller. When the pressure in this chamber reaches a given value and the consequent differential pressure on the under side of the impeller has been lessened to the predeter-

mined limit, the impeller and shaft will drop slightly, thereby opening an escape-port and relieving any excess of pressure in the chamber, so as to keep the differential balancing pressure at about the same point at all times irrespective of the fluctuations in the actual pressure of the water column. In another form of impeller the water column is not completely reversed, but is diverted from an upright longitudinal direction in the casing to a radially-lateral direction while passing through the impeller and is then turned upward again through the upper part of the casing. This impeller is provided with the same balancing-chamber and escape-ports automatically controlled by the rise and fall of the impeller as have been described in connection with the reversing-impeller.

It will be readily understood that other forms of impeller may be employed, but they must be such as to produce an upward hydrostatic pressure on the under side of the impeller, and this must be partially balanced by leakage-pressure in a chamber controlled by the longitudinal movement of the impeller due to the slight variations in the differential pressure.

In the accompanying drawings, Figure 1 is a longitudinal section of the reversing-impeller and its casing. Fig. 2 is a bottom plan view of the impeller. Fig. 3 is a top plan view of the same. Figs. 4, 5, 6, and 7 are diametrical sections of the same on the correspondingly-numbered lines in Fig. 1. Fig. 8 is a side elevation of said impeller. Fig. 9 is a perspective view of a development of the web and flange-wall of the impeller. Fig. 10 is a top plan view of the lower section of the casing. Figs. 11, 12, 13, 14, 15, and 16 are radial sections of the same on the correspondingly-numbered lines in Fig. 10. Fig. 17 is a top plan view of the upper section of the casing. Fig. 18 is a side elevation of the gland for the stuffing-box on a larger scale. Fig. 19 is a diametrical section of the same. Fig. 20 is a bottom plan view of the same. Fig. 21 is a diametrical section of the upper section of the casing. Fig. 22 is a top plan view of the same. Fig. 23 is a side elevation of the inner shell of the same and the radial helical partitions. Fig. 24 is a top plan view of the same. Fig. 25 is a

longitudinal section of the radial impeller and its casing. Fig. 26 is a perspective view of said impeller partly broken away.

The rotatable pump-shaft 1 passes down through the uptake or delivery-pipe 2, being preferably inclosed in a casing 3. The shaft has bearings 4 5 in the upper and lower sections of the casing respectively. In the lower ends of the upper section is located the impeller, which is a circular structure concentric with the shaft, to which it is firmly keyed or otherwise secured. The impeller has a hub 6, surrounded by a disk-shaped body 7, which is provided with a peripheral flange 8, containing packing-grooves and fitting snugly inside the cylindrical lower end 9 of the inner shell 10 of the upper section of the casing. Said cylindrical end 9 is long enough to allow the impeller to have a certain amount of longitudinal play.

Referring now especially to the figures of the drawings illustrating the reversing-impeller, it will be seen that between the hub and the periphery of the impeller is a cylindrical flange 11 extending preferably downward below the bottom of the flange 8 and having a rotating fit inside the upper end of the inner shell 12 of the lower section of the casing. The joint is preferably a rabbeted one, as shown, and the flange 11 has a water-packing groove in it. At certain points, preferably two, a web 13 connects the flange 11 with the hub, whose surface below the disk 7 is preferably tapering and concave, as shown. The outer edge of the web 13 remains always in the same transverse plane, but its inner edge rises in a regular helical line along the surface of the hub, departing farther and farther from the center as it rises until it reaches a point longitudinally in line with the flange 11. That portion of said flange above the plane of junction with the web also veers outwardly, similarly to the web, so that a space of substantially uniform cross-section is maintained between them, the flange-wall moving downward as the web rises until at the point where the web assumes a position parallel with the axis of the hub the flange-wall becomes horizontal and terminates. The relative positions of the web and flange-wall are illustrated in Fig. 9, which is a perspective view of them as they would look straightened out instead of following the circular contour of the hub, as they actually do. In the drawings two webs are shown starting at diametrically opposite points and each continuing for three-eighths of the circumference of the hub. It will be seen from this construction that the water rising through the supply passage in the inner shell 12 will be continuously lifted by the radial edges of the two webs and carried from a point inside the inner shell and flange 11 first upward, then outward, and finally downward to a point outside the flange 11 and between it and the peripheral flange 8. Here it enters an annular cham-

ber in the lower section of the casing concentric with the supply-passage 12. The walls of this chamber 14 are twisted on helical lines in a fashion similar to the web and flange-wall of the impeller, so that the stream of water is carried first downward, then outward, and then upward through an outer concentric annular chamber 14'. By a careful study of Figs. 11 to 16, noting that they are successive radial sections of Fig. 10 through a quarter of its circumference, it is thought that the course and operation of the chamber-walls will be understood. From the outer chamber 14' the water passes up through the annular space 15 between the inner and outer shells of the upper section of the casing, whence it flows into the uptake. In order to counteract the rotary motion of the water as it issues from the chamber 14', the space 15 is divided into segments by helical radial partitions 16, uniting the two concentric shells of the upper casing-section and so inclined as to check the whirl of the water and send it into the uptake in substantially longitudinal lines.

It will be seen that at the point in the impeller where the water is reversed from an upward to a downward direction there will be an upward hydrostatic pressure due to the weight of the water column in the uptake. This pressure tends to lift the impeller and its shaft, and by properly proportioning the parts this lift can be made to counterbalance the rotating parts, so that the shaft will require no step-bearing, but will float, as it were, on the water. In order to regulate this counterbalancing effect so as to maintain the impeller automatically in substantially the same position irrespective of the fluctuations in the water-pressure, I provide above the disk of the impeller a chamber 17, formed inside the inner shell of the upper section of the casing. At its upper end the chamber is made water-tight by a stuffing-box surrounding the shaft 1. The gland 18 of the stuffing-box is flanged, forming a cup to receive the upper end of the hub 6 of the impeller, which has a snug fit in the flange 19. Through said flange are cut ports 20, and the longitudinal motion of the hub inside the flange will open and close these ports. One or more escape-ducts 21 are made through the impeller from the upper end of the hub to points below the disk 7 and opening into the supply-passage 12.

In the operation of the pump the pressure of the water column causes a certain leakage of water past the periphery of the impeller into the chamber 17. As this leakage accumulates in the chamber it counteracts the lifting effect of the pressure on the under side of the impeller, and if allowed to go on unregulated it would soon become so great as to balance that pressure and destroy the value of the water column as a balancing agent for the rotating parts. The ports 20 are therefore so located that when the back pressure in the chamber 17 reaches a predetermined

point, at which the differential pressure on the disk of the impeller is just sufficient to properly balance the rotating parts, then the downward movement of the impeller has been sufficient to open the ports 20 and permit an escape of all subsequent leakage into the chamber to the suction side of the impeller. The device is thus self-regulating, and the impeller will maintain its normal position irrespective of the actual pressure of the water column in the uptake. This automatic regulating action is also secured by the impeller shown in Figs. 25 and 26, which operates by forcing the water outward in radial lines into the lower end of the upper section of the casing. Said upper section is similar to that used for the reversing-impeller; but the lower section is less intricate, being merely a pedestal 22, containing a lower bearing for the shaft 1 and having at its upper end a cylindrical shoulder 23, into which fits a cylindrical packed flange 24 on the impeller. The peripheral flange 8 on the impeller extends upward instead of downward, as in Fig. 1. Under the disk 7 are one or more eccentric webs 25, beginning at the flange 24 and ending at the periphery of the disk and joined to the flange by horizontal plates 26. When two such webs are used, as shown in the drawings, they each run half-way around the impeller. When this impeller is rotated, these webs, whose inner ends are in advance, continuously cut the water and force it radially outward into the upper section of the casing, where it passes up through the compartments between the helical partitions, and so on to the uptake. The hydrostatic pressure of the water column is exerted inwardly on the webs and upwardly on the disk and plates. The water leaking past the flange 8 is received in the chamber 17, and its escape is regulated by the ports 20 and the ducts 21 and hub 6, just as in the case of the reversing-impeller hereinbefore described.

In using these pumps in deep wells I place two or more of them at different depths, each delivering water into a common uptake, or I may arrange them tandem, all acting on the same water column, so that the lower pumps each deliver into the one next above.

Having thus described my invention, what I claim is—

1. In a rotary pump, the combination with an impeller having its under side exposed to the hydrostatic pressure of the water column in the uptake, of a casing having a chamber above said impeller and in which said impeller is free to move longitudinally, and means controlled by the impeller for regulating the pressure in said chamber.

2. In a rotary pump, the combination with an impeller having its under side exposed to the hydrostatic pressure of the water column in the uptake, of a casing containing a leakage-chamber above said impeller, and means

controlled by the impeller for regulating the escape of leakage-water therefrom.

3. In a rotary pump, the combination with an impeller having its under side exposed to the hydrostatic pressure of the water column in the uptake, of a casing containing a leakage-chamber above said impeller, and means whereby the longitudinal movement of said impeller automatically regulates the escape of leakage-water from said chamber.

4. In a rotary pump, the combination with an impeller having its under side exposed to the hydrostatic pressure of the water column in the uptake, of a casing fitting the periphery of said impeller and forming a chamber above it, and escape ports and ducts leading from said chamber and controlled by the longitudinal movement of said impeller.

5. In a rotary pump, the combination with an impeller having its under side exposed to the hydrostatic pressure of the water column in the uptake, of a casing forming a chamber above said impeller, a cupped element in said chamber into which the hub of the impeller enters, ports in said cupped element controlled by said hub, and escape-ducts through said impeller.

6. In a rotary pump, the combination with an impeller having its under side exposed to the hydrostatic pressure of the water column in the uptake, of a casing forming a chamber above said impeller and in which said impeller is free to rise and fall, a stuffing-box for the shaft in said chamber, having a gland provided with a flange containing ports and fitting the upper end of the impeller-hub, and escape-ducts extending from the upper end of said hub to the suction side of the impeller.

7. In a rotary pump, the combination with an impeller having its under side exposed to the hydrostatic pressure of the water column in the uptake, of means for automatically confining the water which exerts a pressure on the upper side of the impeller, and means for automatically governing the escape of said water, so as to produce a differential pressure on the under side of the impeller substantially equal to the weight of the rotating parts.

8. In a rotary pump, the combination with an impeller having its under side exposed to the hydrostatic pressure of the water column in the uptake, of means for automatically confining the water which exerts a pressure on the upper side of the impeller, and means for automatically governing the escape of said water, so as to produce a differential pressure on the under side of said impeller substantially equal to the weight of the rotating parts, and means for maintaining said differential pressure constant.

9. A rotary pump having an impeller provided with a concentric flange one or more portions of which veer outwardly from a longitudinal to a radial position, and one or more webs extending between said flange and the

hub of the impeller and running from a radial to a longitudinal position simultaneously with the change in the flange, and forming with the impeller a passage substantially constant in cross-section.

10. In a rotary pump, the combination with an impeller adapted to reverse the flow of the water, of a casing having concentric communicating passages arranged to reverse the flow of the water again.

11. In a rotary pump, the combination with an impeller delivering the water downwardly, of a casing having concentric passages adapted to receive and reverse the flow of water.

12. In a rotary pump, the combination with an axially-movable impeller adapted to deliver the water downwardly, of a casing having concentric passages arranged to reverse the flow of water, and means for automatically counterbalancing the upward reaction on the impeller.

13. In a rotary pump, the combination with an axially-movable impeller delivering the water downwardly, of a casing containing a leakage-chamber above said impeller, and means controlled by the impeller for regulating the escape of leakage-water from said chamber.

14. In a rotary pump, the combination with an axially-movable impeller delivering the water downwardly, of a casing containing a leakage-chamber above said impeller, and means whereby the axial movement of the impeller automatically regulates the escape of leakage-water from said chamber.

15. In a rotary pump, the combination with an axially-movable impeller delivering the water downwardly, of a casing fitting the periphery of said impeller and forming a chamber above it, and escape ports and ducts leading from said chamber and controlled by the axial movement of said impeller.

16. In a rotary pump, the combination with an impeller delivering the water downwardly, of a casing forming a chamber above said impeller, a cupped element in said chamber into which the hub of said impeller enters, ports in said cupped element controlled by said hub, and escape-ducts through said impeller.

In testimony whereof I affix my signature in presence of two witnesses.

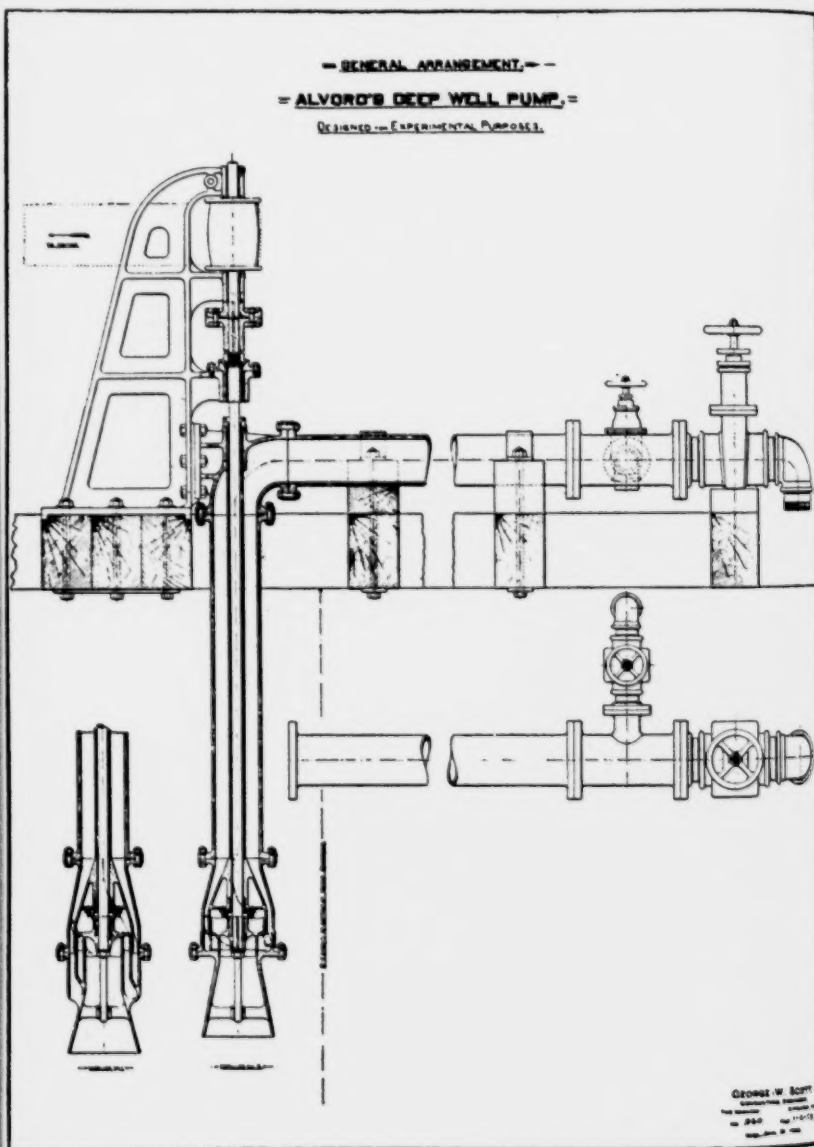
JOHN WATSON ALVORD.

Witnesses:

R. L. OTWELL,

V. K. MORRIS.

## Defendants' Exhibit "A-10."



[Endorsed]: In the United States District Court, Northern District of California, Southern Division. In Equity—No. 485. Layne & Bowler Corporation, Plaintiff, vs. Western Well Works, Inc., a Corporation, et al., Defendants. Defendants' Exhibit "A-10." Hattie B. Lehman, Notary Public.

Filed Sep. 2, 1920. W. B. Maling, Clerk. By J. A. Schaertzer, Deputy Clerk.

No. 3627. United States Circuit Court of Appeals for the Ninth Circuit. Filed Jan. 6, 1921. F. D. Mouckton, Clerk.

---

**Defendants' Exhibit "D."**

UNITED STATES OF AMERICA,  
DEPARTMENT OF THE INTERIOR,  
UNITED STATES PATENT OFFICE.

To all to whom these presents shall come, GREETING:

THIS IS TO CERTIFY that the annexed is a true copy from the Records of this Office of the File Wrapper and Contents, in the matter of the

Letters Patent of  
MAHLON E. LAYNE.

Number 821,653,                      Granted May 29, 1906.  
for

Improvement in Well Mechanism.

IN TESTIMONY WHEREOF I have hereunto set my hand and caused the seal of the Patent Office to be affixed at Washington, in the District of Co-

lumbia, this 23d day of August, in the year of our Lord one thousand nine hundred and twenty, and of the Independence of the United States of America the one hundred and forty-fifth.

[Seal]

M. H. COULSON,  
Acting Commissioner of Patents.

Case 6.

1903.

Number (Series of 1900.)

154,704.

389.

(Ex'rs Book)

~~55-12~~  
50-837

PATENT No. 821,653.

Name Mahlon E. Layne,  
of Houston,  
County of  
State of Texas.  
Invention

Well Mechanism.

Division of App. No. ...., filed ..... 190..

PARTS OF APPLICATION FILED.

ORIGINAL.

RENEWED.

Petition,	April 28, 1903	, 190
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*vs. Layne & Bowler Corporation.* 959

Examined F. M. Tryon, Ex., Oct. 30, 1905 ,190  
Countersigned, J. W. Melsey, ,190  
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For Commissioner.  
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" " Cert. ,190 ,190  
Patented May 29, 1906  
Associate Attorney,

Attorney PAUL SYNNESTVEDT,  
518 Frick Bldg.,  
Pittsburg,  
Pa.

Name Serial Number  
Patent No. Date of Patent.

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154,704.

154,704 No. 1½

Law Offices of

PAUL SYNNESTVEDT.

Patents, Trade Marks, Copyrights.

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Cable Address, PAULSYN.

PAUL SYNNESTVEDT,

Counselor at Law and Expert in Patent Causes.

PAUL CARPENTER,

Patent Attorney.

\$15 00. Received

Apr.

28

1903.

960      *Western Well Works, Inc., et al.*

ck. F.

Chief Clerk U. S. Patent Office.

Pittsburgh, April 27, 1903.

Hon. Commissioner of Patents,

Washington, D. C.

Sir:

Herewith I hand you my check #7091 for \$15 to cover the Government filing fee in the application of Mahlon E. Layne for patent on Well Apparatus (Case #6). The petition, specification and oath are attached hereto, and the drawings (4 sheets) are sent by separate mail.

Very respectfully,

PAUL SYNNESTVEDT,

Per C. H. EBERT.

154,704.

1

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PAUL SYNNESTVEDT,

Counselor at Law and Expert in Patent Causes.

PAUL CARPENTER,

Patent Attorney.

Mail Room. U. S. Patent Office. Apr. 28, 1903.

PETITION.

To The Commissioner of Patents:

Your Petitioner, Mahlon E. Layne, a citizen of

the United States of America, residing at Houston, County of Harris and State of Texas (his postoffice address being Houston, Texas), prays that Letters Patent may be granted to him for the new and useful improvements in

WELL MECHANISM (Case 6)

set forth in the annexed specification; and he hereby appoints PAUL SYNNESTVEDT (Registry No. 106-#518 Frick Building, Pittsburg, Pa.), his attorney, with full powers of substitution and revocation, to sign his name to the drawings, to prosecute this application, to make alterations and amendments therein, to receive the patent, and to transact all business in the Patent Office connected therewith.

MAHLON E. LAYNE.

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OATH.

State of Illinois,  
County of Cook,—ss.

Mahlon E. Layne, the above-named petitioner, being duly sworn, deposes and says, that he is a citizen of the United States of America, residing at Houston in the County of Harris and State of Texas, and that he verily believes himself to be the original, first and sole inventor of the new and useful improvements in

WELL MECHANISM

described and claimed in the annexed specification; that he does not know and does not believe that the same was ever known or ever used before his inven-

tion or discovery thereof; or patented or described in any printed publication before his invention or discovery thereof, or more than two years prior to this application; or in public use or on sale in the United States for more than two years prior to this application; and that no application for patent on the said invention has been filed by him or his legal representatives or assigns in any country foreign to the United States.

MAHLON E. LAYNE.

Sworn to and subscribed before me, this 3d day of April, A. D. 1903.

[Seal]

PAUL CARPENTER,

Notary Public in and for the County in the State aforesaid.

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Case 6.

### SPECIFICATION.

#### TO WHOM IT MAY CONCERN:

Be It Known That I, MAHLON E. LAYNE, a citizen of the United States, residing at Houston, County of Harris and State of Texas, have invented certain new and useful improvements in

#### WELL MECHANISM,

of which the following is a specification.

My invention relates to the apparatus used for drawing water from driven or artesian wells, and particularly to the means for adjusting a pump therein. The objects of the invention are, to provide means by which the piping and the pump may

be all assembled in proper shape before inserting it into the well; to provide means by which a pump may be placed in any desired position in a well, centered, raised or lowered and fixed in position by manipulating from the outside entirely; to provide means for adjusting the length of the piping leading from the pump to the surface at will and to lower the pump from time to time without taking it out of the well; to provide improved means for centering and fixing the pump in proper position in the well casing; to provide improved means for manipulating the packing of the pump shaft, and proper adjustment of the pump in place by means at the surface of the ground; to provide for the proper action of a pump without stopping up the well, so that water may be either flowed into or pumped out of the same at pleasure; to provide a superior mounting for a centrifugal pump in the well, manipulated from the surface of the ground; to provide an extensible pump shaft separately supported at intervals along its length; to provide an automatic centering device for the pump in the well; to provide for mounting the pump and the shaft in a closed casing which is open to operate from the top; to obviate the necessity of making large wells for descending into them in order to ar-

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range the pump, and to generally improve and cheapen the apparatus used for the above purposes.

The above objects, as well as other advantages which will hereinafter appear, I attain by means of the construction and assemblage of parts as illus-

trated in preferred forms in the accompanying drawings, wherein—

Figure 1 represents a section of a well showing the preferred form of my apparatus in place therein.

Figures 2, 3 and 4 are horizontal sections of the shaft casing respectively taken on line 2 of Figure 1, and lines 3 and 4 in Figure 5.

Figure 5 is an enlarged central vertical section taken through the pump and the casing of the well.

Figure 6 is a horizontal section of Figure 5 taken along the line 6.

Figure 7 is a section of a top of the well casing containing the pump shaft and its mounting: Figure 8 is a similar section taken at one of the joints of the pump shaft casing.

Figure 9 is a section taken through the casing containing the pump shaft at the collar 28 in Figure 1.

Figure 10 is a vertical section of a well having a modified form of the apparatus therein.

Figure 11 is a side view and partial section of a centrifugal pump mounted by a modified method.

Figure 12 is a half plan and half section of the pump shown in Figure 11, taken along the line 12 therein.

Figure 13 is a partial vertical section taken through the shafting and its mounting shown in Figure 10 at the point marked 68.

For convenience of illustration the apparatus is shown as applied to a well which passes through two water bearing strata separated by an impervious stratum, the top surface of the ground being

also an impervious layer of earth. The upper  
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chamber 15 of the well may be protected by wooden framing as customary, or it may be but a continuation of the chamber enclosed by the casing 16, which may be carried to the surface if desired, and the chamber 15 dispensed with. Below this is a screen 17 in the sand layer, and still below the screen 17 is another casing 18, into which extends the suction pipe 22, from the pump 21, and below this another screen 19.

In the approved form as illustrated in Figure 1, I use a centrifugal pump 21, single or in a series, as may be desired, and having a top discharge. It is attached to a casing 20, which runs to the top of the well and encloses the driving shaft 39 of the pump, which may be driven by a pulley 25, mounted in the framework 24, in any approved manner. An outlet pipe 23 leads from the pump to the surface to carry off the water. As shown in Figure 2, the shaft casing 20, and the outlet pipe 23, are bound together by means of the block-and-strap arrangement 26. These connecting devices are distributed at intervals along the length of the shaft casing. In order to previously assemble all the parts and then put the pump into the well and fix it in position therein, I provide a system of wedges 33, which serve to fix the pump in place and hold it in the proper vertical position, designed to be operated by means from the top of the well, avoiding the necessity of a man's going into the well in order to fix the pump in place. Pivoted to an extension on the

head of the centrifugal pump, casing 37, I provide a series of toggle links 34, which are carried in slots in the extension 36 of the casing, and at their outer ends bear wedge blocks 35, which embrace and co-operate with the vertically movable wedges 33, placed against the casing 16. The wedges 33 may be attached to links 39, which are carried by a sliding collar 28 on the casing 20, the collar 28 being operated by a rod 27, which runs to the top of the well, so that from the top the wedges 33 may be raised and lowered into place and can be tightened

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therein. The toggle links may be also connected by links 32, to a collar 31, and the collar 31 to a rod 30, which extends to the top of the well as before, in order to manipulate it without going into the well. Thus in order to obtain greater power and fix the wedges more securely in place, it will be observed that by pulling up on the rod 32, the toggle links 34 will cause the wedge blocks 35 to press with great power against the wedges 33, and thus fix the pump casing in place wherever desired.

The pump shaft 39 is enclosed in a shaft casing 20, which latter is made in joints and may be of any desired length. The pump shaft also is made in sections, 39, 39' 39'', which are attached together by means of sliding keys so as to allow of some vertical play with relation to each other. From Figure 5 it will be seen that the shaft 39 passes through a block 47, and at its top is fixed in the bearing block 48 by means of the pin 50, as shown in Figure 4. The next section of the shaft, 39', is inserted into the



block 48, and prevented from rotating by means of the key 49, which is splined therein. The weight of the shaft and pump below the block 47 is carried by the block 48; and from Figure 8 it will be seen that a similar arrangement is made at the top of the next section of the shaft casing, where the block 47' supports the weight of the section of shaft 39' by means of the collar 48', connected by a pin and key as before.

At the top, the casing 20 is closed and is provided with a stuffing-box 50, closed by the cap 51, at the top of the shaft 39". The shaft 39 is fixedly keyed to the vanes 38 of the centrifugal pump, and below the pump casing 21 is a pipe 22, which extends down below the water level and is extended any desired depth in the well.

The casing 20 also contains a tubular rod 44, which has a bearing in the block 47 on top of the pump casing 37, as shown in Figure 5, and is pro-

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vided with a square opening which co-operates with the head of the screw 42, used for adjusting the cap 41 of the packing box 40 for the pump, and compressing the packing in place. In order that this cap 41 may be raised and lowered evenly, the screw 42 is provided with a sprocket wheel, and two other screws of a similar kind are distributed about the cap, as shown in Figure 6, and connected by means of the sprocket chain 46, so that by means of the tubular shaft 44, all three of said screw 42 may be turned at once to compress the packing in box 40.

This pipe is tubular shaft 44 also serves the purpose of providing convenient means for forcing the liquid out of the pump shaft casing. By forcing air in at the top of the casing 20, by means of the pipe 52, the liquid can be forced down to the bottom of said casing 20, and by means of the small opening 45, in the bottom of the tubular shaft 44, the fluid can be forced out at the top 54, and keep the casing clear in order to leave the bearings clean therein and not interfere with the working of the pump, or by forcing fluid in at the top 54, the operation will be reversed, and the fluid ejected from pipe 52.

It will be noticed that the weight of the pump and its shaft is supported at each end of the sections of the casing by the blocks 47, 47', etc. By reason of this arrangement the pump shaft and the shaft casing can be made in separable sections, and consequently the pump may be inserted at any desired depth and the parts assembled before putting them into the well. The wedge system illustrated for tightening the pump casing in place may also, if desired, be used to center it with respect to the casing. The outlet pipe 23 is also preferably made in sections to correspond with the sections of the pump shaft casing.

In Figures 10 to 13 I have shown a modified form of the apparatus which uses a simple series of wedges for fixing the pump in place, as illustrated

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best in Figure 11. The pump casing has a plat-

form 61, and a depending ring flange 66, and a series of wedges 63 are placed around the depending flange 66, and are connected to the top platform by means of a series of screws 65. A series of co-operating wedges 62 may also be provided, suspended from the platform 61 by means of the screw 64, and the two series of wedges surround the whole casing. It will sometimes be convenient to dispense with the outlet pipe 23, and extend the casing 16 to the top, to act itself as the conveying channel for the liquid. In each case, of course, the pump casing 21 and platform 61 will be made water-tight within the casing 16, and for this purpose the wedges 62 will be made in overlapping sections, in order to break the joints seen in Figure 12. The pumps will then deliver directly into the upper casing. It will be plain that by turning the screws 65, the bottom wedges are drawn upward against the wedges 62, by which the casing of the pump is fixed in any desired place and tightened in the well casing 16. The screws 65 may be operated by means of a socket wrench placed upon a long rod and reached from the surface of the ground, or may be extended to the surface of the ground, as desired.

In the case illustrated, the top of the pump shaft may be provided with a pulley 25, as before, and a bearing fixed on some part of the framework, as on the cross beam 57. Extending downward from the beam 57 may be provided a timber 56, and part way down a bearing and support providing for the casing of the pump shaft 60, by means of the block 67, which is carried upon a cross frame 68; and a packing box therein, 71, is closed by a screw 70, the whole

being attached to the timber 56 as shown in Figure 13. Below this point the shaft 39 may be enclosed in a casing 60, which is screwed in the block 67, as shown in said Figure. For additional security the block 67 may be attached to the timber 56, by means of the strap 69, which surrounds the

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same. The casing 60 may be in sections and of any desired length.

I prefer, generally, to allow for free flow of water down the well outside of the pump casing and the pump, in order that water may be drained into the well when desired, rather than pumping the water out; which I attain by dropping the wedges 63 and thereby loosening the wedges 62 from the casing 16, permitting water above pump to pass into the strata supplying the well.

I generally prefer to extend the piping 22 entirely through the first water bearing stratum and into the second, as shown in the screen 19; it being understood that the water from the first stratum will flow down the casing 18 to the second when the water level falls sufficiently therefor.

In general I prefer the form of apparatus as shown in Figure 1, both because the means for fixing the pump in place is more easily adjusted, and because of the superior mounting of the pump shaft inside the sectional casing as therein shown, and making the pump shaft in sections. But in cases where the pump will not be moved for a long time, the device of Figure 11 may be used for wedging it in place.

It will be seen that by fastening the pump within the casing in such position as to leave an unobstructed passage around it, I provide for draining water into the well in cases where this is desired, as often happens when fields are flooded, and when it is desired to drain the fields. The whole apparatus being self-contained, can be put together in proper form and lowered into the well at once. It will be seen also that the toggle levers used for actuating the wedges may be used or not, as desired, since the wedges alone will be amply sufficient in the apparatus of Figure 1, as well as in that of Figure 10. I consider it of great advantage also to

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arrange the pump shaft in a closed casing with stuffing box at surface of ground at top of pump, so that by the use of the packing boxes an air-tight chamber can be maintained, and water kept out of the casing 20, or kept filled with clean liquid, if desired, thereby providing an efficient lubricating system for all bearings of the pump.

The many advantages of this apparatus will be apparent to those familiar with the use of such devices from inspection of the drawings.

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Having thus described my invention and illustrated its use, what I claim and desire to secure by letters patent, is the following:

1. In well apparatus the combination with a pump and means for suspending it from the top of the well, of wedging devices for fixing the pump at any desired point within the well casing.

2. In well apparatus the combination with a pump and means for suspending it from the top of the well, of centering and wedging devices for fixing the pump at any desired point within the well casing.

3. A pump provided with a closed driving shaft casing extending to the top of the well from the pump, a pipe extending downward from the pump casing and means for fixing the pump at any desired point in the well casing, substantially as described.

4. A pump provided with a closed driving shaft casing extending to the top of the well from the pump, a pipe extending downward from the pump casing and means for fixing the pump at any desired point in the center of the well casing, substantially as described.

5. The combination with a pump of an extensible pump shaft therefor and means for supporting the pump at any desired point in the well, and independent support for the shaft.

6. The combination with a rotary pump of an extensible pump shaft therefor and means for supporting the pump at any desired point in the well.

7. The combination with a pump of a sectional pump shaft casing surrounding said pump shaft and extending to the top of the well from the pump, a pipe extending downward from the pump casing and means for fixing the pump at any desired point in the center of the well casing, substantially as described.

top of the well and means for fixing the pump in position at any desired point of the well casing.

21.34 6. In well mechanism in combination with a pump, a series of wedges with means for attaching them to the pump, a series of wedges operated from the top of the well by means of links, a series of wedges carried by the pump casing and operated by toggle links attached to a rod extended to the top of the well, for the purposes specified.

6.1.14 9. The combination with a pump casing of two series of wedges with means for moving them with relation to each other to wedge the said pump casing against the sides of the well casing, substantially as described. ✓

4.12. In combination with a well casing and a pump, a series of wedges suspended by rods from the top of the well for operating the same to wedge the pump casing against the well casing, substantially as described.

6.11. In well mechanism a pump casing provided with a series of wedges mounted upon toggle links therein to wedge the said casing against the side walls of the well casing, substantially as described.

2.9.04 9.12. In well mechanism the combination with a rotary pump of a jointed pump shaft and a closed casing surrounding the pump shaft from the pump to the top of the well. *a pump casing of*

2.1.04 11.12. In well mechanism in combination with a pump shaft supported at intervals by blocks pinned thereto and having tapered joints in said blocks whereby the different sections of the pump shaft may have a vertical play with relation to each other. *and in closed shaft*

11.11. A pump casing provided with a stuffing *a closed shaft casing protecting the stuffing* box plug, means for raising and lowering said



and means for moving all of said screws at once and means for operating the screws from the top of the well, substantially as described.

1218. In pump mechanism the combination with wedges for fixing the pump in the well casing, of a casing for the pump shaft, a collar thereon and links extending from said collar to the top of the well and to the said wedges.

1219. The combination with a pump and its actuating shaft of a sectional casing therefor provided at each end of each section with a fixed block with bearings for the shaft, the casing being closed at the top and provided with an air vent.

1220. The combination with a pump of a pump shaft casing closed at the top and bottom and provided with an interiorly disposed hollow rod for the escape of liquid from the shaft casing and an air inlet at the top of the casing.

1221. In well mechanism the combination with a rotary pump of a pump shaft made in sections <sup>independently supported and</sup> joined by blocks and keys in the blocks and ends of the shaft sections <sup>and a casing around</sup>.

1222. A pump shaft made in sections, each section being suspended on a bearing by means of a block pinned to the shaft section and the next section being splined into said block to rotate therewith.

1223. The combination with a rotary pump, of a pump shaft and shaft casing surrounding the shaft, the shaft and casing being in sections and connected by bearings at each end, and the shaft section being separately supported in each section of the casing, as described.

1224. In well apparatus the combination with a pump and means for suspending it from the top of the well, of means



the pump is at a desired point within the well casing.

In well apparatus the combination with a pump and means for <sup>fixing and bearing from the well, and</sup> coupling it from the top of the well, of devices for guiding it at any desired point in the well casing, and means for operating the fixing devices from the top of the well.

*Independently supported*  
1/24. A pump shaft made in sections and suspended in a pipe and provided with bearings and means for lubricating the same.

*and means*  
1/24. In well apparatus the combination of a pump, a casing, therefor, and means for fixing the pump in predetermined position, whereby water is prevented from passing between the casing and the pump into the well.

976      *Western Well Works, Inc., et al.*

In Testimony Whereof, I have hereunto set my hand this 3rd day of April, A. D. 1903, at Chicago, Illinois.

MAHLON E. LAYNE.

Witnesses:

PAUL CARPENTER.

ALBERT C. HOWARD.

154704

4500

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2-26.

437

Room No. 120.

Paper No. 1.

All communications should be addressed to

All communications respecting this application should give the serial number, date of filing, and title of invention.

"The Commissioner of Patents,  
Washington, D. C."

DEPARTMENT OF THE INTERIOR.

UNITED STATES PATENT OFFICE,

Washington, D. C. June 1, 1903.

Patent Office

June—1903

Mailed

Mahlon E. Layne,  
Care, Paul Synnestvedt,  
518 Frick Bld'g.,  
Pittsburg, Pa.

Please find below a communication from the EXAMINER in charge of your application, for Well Mechanism, filed April 28, 1903, Ser. No. 154,704.

F. I. ALLEN,  
Commissioner of Patents.

This application has been examined.

Claims 1, 2, 9, 21, and 22 are rejected on Cavallaro, #524,666, Aug. 14, 1894, Artesian and Oil Wells, Tubing and Packing.

Claims 3, 4, and 7 are rejected on Cavallaro above cited and Crannell, #425,933, April 15, 1890, Pumps, Rotary, Single Piston.

Claims 5 and 6 are rejected on Cavallaro above cited, and Northam, #633,474, Sept. 19, 1899, Pumps, Rotary, Single Piston.

Claim 8 is inaccurate, since it states three sets of wedges and only two sets are shown. Properly corrected this claim will be allowed.

Claims 12, 13, and 18 are rejected on the ground that it would not require invention to form the extensible shaft shown in the patent to Northam with joints such as are shown in the patent to Barker, #264,997, Sept. 26, 1882, Journal Boxes, Pulleys and Shafting, Shafting.

Claim 14 is rejected on Redmond, #59,319, Oct. 30, 1866, Artesian and Oil Wells, Tubing and Packing, and Rhodes, #644,638, March 6, 1900, Artesian and Oil Wells, Drilling and Boring.

Claim 17 does not define the construction. Moreover, so far as seen the hollow rod and the air inlet at the top of the casing are one and the same thing. The claim is rejected.

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Layne.—2.

Claims 19 and 20 are allowable as at present advised.

Claim 23 is rejected on Northam above cited and Cook, #603,260, May 3, 1898, Journal Boxes, Pulleys and Shafting, Journal Boxes, Lubricating.

Claim 24 can be read only on the construction shown in Figs. 10 to 13 inclusive and should not be presented in the same application as the remaining claims.

Claims 10, 11, 15, and 16 are allowed.

F. M. TRYON, Ex.

350

WHITEHEAD,

Asst. Ex.

154704

18

Mail Room

Paper No. 2

Feb. 1, 1904

U. S. Patent Office

Law Offices of

PAUL SYNNESTVEDT

Patents, Trade Marks, Corporations

518 Frick Building

518 Monadnock Block

Pittsburgh, Pa.

Chicago, Ill.

Long Distance Telephones

Cable Address—PAULSYN.

PAUL SYNNESTVEDT,

Counselor at Law and Expert in Mechanics.

PAUL CARPENTER,

Patent Attorney.

FRANCIS W. H. CLAY,

Attorney and Counselor at Law.

United States Patent Office,  
February 1, 1904. Division IX.

In re Application of Mahlon E. Layne  
For WELL APPARATUS

Filed April 28, 1903.

Serial No. 154704

(Room 120).

Cls. 20-22

Pittsburgh, Pa., January 30, 1904.

The Hon. Commissioner of Patents,  
Washington, D. C.

Sir:

In response to the Examiner's letter of June 1, 1903, in the above case, the applicant amends as follows:

Claim 4, line 4, after "casing" insert; / and sealing it off from the water in the well. /

Claim 5 line 2, erase "and." At the end of the claim insert a / comma / and the words: / and independent supports for the shaft. /

Claim 6 line 2, at the end of the line after the word "pump" insert; / and shaft.

Claim 7 line 1, before "pump" insert / rotary. /

Claim 8 line 1, after "pump" erase the words; "a series of wedges with means for attaching them to the pump."

Claim 13 line 1, after "pump" insert; / and a closed shaft casing.

Claim 14 line 2, before "screws" insert; / a closed the shaft casing protecting the bearings from/water. /

Claim 17 last line, erase the words "same and" and insert; / shaft casing and /

Claim 18 line 2, after "sections" insert; / independently supported and /. At the end of the claim insert a / comma / and the words; / and a closed casing around the shaft. /

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Claim 22 line 2, before the final word "devices" insert; / a casing separating the pump and bearings from the well, and. /

Claim 23 line 1, before "sections" insert; / independently supported. Line 2, before "pipe" insert closed.

Claim 24 line 2, erase the word "and". Line 3, insert a / comma after "position" and the words / and means. /

Erase claims; 1, 2, 9, and 21, and insert the following claims 21, 22 and 23: after re-numbering the remaining claims:

20 ~~24~~. The combination of a well casing, a rotary pump therein, and a line shaft for the pump entirely closed off from the water in the well.

21 ~~22~~. The combination of a well casing, a rotary pump therein, means for

A

desired

fixing it at any A ~~desire~~ point in the well, an extensible line shaft for the pump and a shaft casing entirely enclosing the shaft and bearings.

22 ~~23~~. The combination of a well casing, a rotary pump therein, means for fixing it at any desired

point, a shaft casing, and a discharge  
12, 23, 04 outlet from the pump independent of  
insert communicating with the pump casing only  
12, 31, 04 at the bottom of the well.  
C the shaft casing and A sealed off from  
the well casing below the pump.

---

The references have been carefully examined. The Examiner's attention is first called to the fact that in applicant's device the line shaft and all its bearings are completely closed off from the water in the well, and that the line shaft is supported at various points in the various sections, and that either in the device of Figure 5 or in the device of Figure 10, the outlet for the water from the pump is independent of the casing which surrounds the line shaft, and in case the pump casing is sealed off completely as in Figure 10 the discharge may be through

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the upper end of the well casing and still the water does not come in contact with any of the bearings or the line shaft.

The patent to Cavallaro of course does not show a pump casing separate from the pump of a casing which fits around the pump shaft and seals it off from the inflowing water, as this is merely a device for a constantly flowing well and amounts nothing more than a valve for stopping the upward flow therein. The patent to Crannell not only shows a pump which cannot be fixed at any desired point in the well and which does not operate directly upon the water to raise it through an independent shaft, but the lower bearings in the pump are directly ex-

posed to all the sand and detritus in the water, and the pump is virtually an air pump, being entirely inoperative without the use of the air pump at the top of the well forcing the air in through the pipe 30. There are of course shown no bearings for the line shaft except the ones at the bottom and the line shaft is not extensible, and it will be observed that this pump cannot be used in a well in which the casing may serve as a conduit for water in any case, and necessitates a large well which works on an entirely different principle from applicant's device. It does not appear how the Northam pump can be held to show an extensible shaft inasmuch as the shaft that belongs to any one of the pumps is not extensible and the only way to extend the shaft at all is to put in a new pump. In other words each one of the pumps and its shaft is independently supported, but there is no extensibility of the shaft to any one of the pumps. Moreover it will be observed that all the bearings are directly exposed to the sand and detritus in the water and this is the particular thing which applicant is attempting to

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## 21

avoid. The Barker device is not applicable as a reference to this case because it does not allow of any play in the shaft itself; it merely allows the entire shaft to move as a unit through the bearings, and this is not a feature which is applicable to this applicant's device. Moreover being an entirely foreign art it does not show any applicability to a well screen.

The patent to Redmond merely shows a device for



sealing off a small pipe from a large pipe, it does not show a shaft nor any means for sealing off the shaft therein. It is not supposed that this applicant is the inventor of the broad idea of using a wedge for fixing a device at a particular point in the well casing, but only that he is the originator of the idea of operating the tightening mechanism for the pump by means entirely enclosed in the shaft casing and not exposed to the deleterious effect of the water being pumped through the well. The Redmond device is therefore not a reference to anything now in the claims. For this same reason the patent to Rhodes is not applicable as a reference.

Original claim 23 was not met because it does not show a shaft suspended within a closed pipe as specified, and it will be observed that as amended it entirely distinguishes from the prior art, as before said the Northam patent does not show a pump shaft which is extensible but a series of pump shafts each one of which is integral, and moreover the shaft is not enclosed in a casing independent of the pump, which is the essential feature of this device. In fact none of the references show a closed driving shaft casing which extends from the top of the well

means to fix

from the pump and ~~A being affixed~~ to the pump in the well casing. These two features are necessarily combined because the essential thing of the invention is the drawing up of the water from below the

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pump and discharging it through an outlet which is independent from the casing enclosing the bearings,

whereby the bearings are entirely protected from the flowing water. For this reason such claims as original 3 are respectfully re-submitted for examination. The uncertainty in original claim 8 was inadvertent owing to the repetition of a clause therein which has been erased in lines 1 and 2. It is respectfully submitted that the claims as now written are allowable over these references, and in case of rejection the Examiner is asked to point out element for element the claims anticipated.

MAHLON E. LAYNE.

By His Attorney,

PAUL SYNNESTVEDT.

154704

~~1600~~

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2—260.

Div. 9. Room 142.

All communications should be addressed to

"The Commissioner of Patents,  
Washington, D. C."

Paper No. 3.

All communications respecting this application should give the serial number, date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR.

UNITED STATES PATENT OFFICE.

Washington, D. C., February 15, 1904.

Patent Office. Feb. 15, 1904. Mailed.

Mahlon E. Layne,

Care, Paul Synnestvedt,

518 Frick Bldg.,

Pittsburg, Pa.

Please find below a communication from the EX-

AMINER in charge of your application, for Well Mechanism, filed April 28, 1903, Ser. No. 154,704.

F. I. ALLEN,  
Commissioner of Patents.

This application has been considered as amended Feb. 1, 1904.

The requirement that claim 20 (original 24) be presented in a different application from the remaining claims is repeated, since, as pointed out in the last Office letter, that claim can be read only on the form of the device shown in Fig. 10.

In Claim 21, line 2, "desire" should be desired.

It should be stated before which word "pump" in line 1 of claim 5 the word "rotary" should be inserted, and this claim should be properly punctuated.

Claim 2 is inaccurate, since the pump is not sealed off from the water in the well. When properly corrected this claim will be allowed.

Claim 4 is rejected on the ground that it does not distinguish in terms from an aggregation of features shown in Northam and Cavallaro, both of record.

Claim 9 does not distinguish in terms from an aggregation of Northam and Crannell, both of record, and is rejected.

Claims 23 is not understood. So far as seen the discharge outlet from the pump is not sealed off from the well casing below the pump. If it is intended that this claim shall read only on the form shown in Fig. 10 then it should not be presented in this application.

986      *Western Well Works, Inc., et al.*

The remaining claims are allowed.

F. M. TRYON,  
Ex.

R. F. WHITEHEAD,  
Asst. Ex.

154704

24

Paper No. 4.

Mail Room. Dec. 9, 1904. U. S. Patent Office.  
U. S. Patent Office. Dec. 10, 1904. Division IX.

Law Offices of

PAUL SYNNESTVEDT

Patents, Trade Marks, Corporations

518 Frick Building 518 Monadnock Block

Pittsburgh, Pa. — Chicago, Ill.

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Cable Address PAULSYN

PAUL SYNNESTVEDT,

Counselor at Law and Expert in Mechanics.

PAUL CARPENTER,

Patent Attorney.

FRANCIS W. H. CLAY,

Attorney and Counselor at Law.

In re Application of M. E. Layne for Well Apparatus. Filed April 28, 1903. Serial No. 154,704. (Room 142.)

Pittsburgh, Pa., December 8, 1904.

Cl. 4.

Hon. Commissioner of Patents,  
Washington, D. C.

Sir:

In response to the Examiner's letter of February

14, 1904, in the above case, the applicant amends as follows:

Erase the insert at the end of line 4, claim 2, and substitute / "and sealing said shaft off from—? / water in the well," / (that is, change the word "It" in the former amendment to / said shaft). /

Re-write claim 4 as below:

4. The combination of a rotary pump, and extensible pump shaft and protecting casing for the shaft, and means for supporting the pump and shaft and casing at any desired point within the well.

In claim 5, line 1, the word "rotary" should be inserted before the first occurrence of the word "pump." Make a comma after this word "pump," and in line 2 change "said" to / the. /

Claim 9, line 1, after "with" insert / a pump casing, of. /

Erase claim 20.

Claim 22, line 2, spell the word "desired."

As to claim 23, it is submitted the Examiner misapprehends. The discharge outlet is sealed off from the well casing below the pump in all instances,—that is, the water cannot enter the pipe 22 from the well casing anywhere except at the bottom, so that

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the water from all strata, though it may enter the casing 18 or the casing 17, cannot get into the outgoing stream without passing to the bottom of the

whole well. It is believed the language makes this clear when the claim is read as a whole, and does not require change. Any suggestion as to clearer wording which the Examiner may suggest will be accepted, if it is necessary.

Respectfully submitted,

MAHLON E. LAYNE.

By his Attorney,

PAUL SYNNESTVEDT,

C.

154704

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2—260.

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Div. 9. Room 142.

All communications should be addressed to

"The Commissioner of Patents,  
Washington, D. C."

Paper No. 5. J. L. D.

All communications respecting this application should give the serial number, date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR.

UNITED STATES PATENT OFFICE,

Washington, D. C., December 20, 1904.

Patent Office. Dec. 20, 1904. Mailed.

Mahlon E. Layne,

Care, Paul Synnestvedt,

Pittsburg, Pa.

Please find below a communication from the EXAMINER in charge of your application, for Well Mechanism, filed April 28, 1903, Ser. No. 154,704.

F. I. ALLEN,

Commissioner of Patents.

This application has been considered as amended  
Dec. 9, 1904.

Claim 22 (original 23) is not clear. The expression "sealed off from the well casing below the pump" is not seen to be accurate. It is true that the pump has a closed casing with a suction pipe extending below the same so that any water that would leak into the well could reach the pump only through the suction pipe, but this would be true of any pump of this type which might be placed in a well, for example that shown in Andrews, #4418, March 14, 1840, Pumps, Rotary, Single Piston.

The remaining claims are allowed.

F. M. TRYON,  
Ex.

WHITEHEAD,  
Asst. Ex.

150

154704

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Mail Room. Dec. 23, 1904. U. S. Patent Office.  
U. S. Patent Office. Dec. 24, 1904. Division IX.

Law Offices of

PAUL SYNNESTVEDT

Patents, Trade Marks, Corporations  
518 Frick Building 518 Monadnock Block  
Pittsburgh, Pa. — Chicago, Ill.

Long Distance Telephones

Cable Address PAULSYN

PAUL SYNNESTVEDT,

Counselor at Law and Expert in Mechanics.

PAUL CARPENTER,

Patent Attorney.

FRANCIS W. H. CLAY,

Attorney and Counselor at Law.

990      *Western Well Works, Inc., et al.*

In re Application of M. E. Layne for Well Apparatus. Filed April 28, 1903. Serial No. 154,704. (Room 120.)

Pittsburgh, Pa., Dec. 22, 1904.

Hon. Commissioner of Patents,  
Washington, D. C.

Sir:

In response to the Examiner's letter of December 20, 1904, in the above case, applicant amends claim 22 (original 23) by erasing at the end the clause "sealed off from the well casing below the pump" and inserting / communicating with the pump casing only at the bottom of the well.

The claim is distinguished from Andrews by the several other limitations.

Respectfully submitted,

MAHLON E. LAYNE.

By his Attorney,  
PAUL SYNNESTVEDT,

C.

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154704

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LAW OFFICES OF  
**PAUL SYNNESTVEDT**  
PATENTS TRADE MARKS CORPORATIONS  
315 FRANKLIN AVENUE  
CHICAGO, ILL.

In re Application of M. E. Layne  
for NEW APPARATUS  
Filed April 20, 1904  
Serial 1-155,700  
(2000, 145)

Pittsburgh, Pa. December 30, 1904.

Hon. Commissioner of Patents,  
Washington, D. C.

Sir:-

In the matter of the above application, please enter  
the following amendment:

Add claim 23, as follows:

23.- A driving device for transmitting  
power comprising in combination a shaft, a closed  
tube surrounding said shaft and boxes in said tube  
forming bearings for the shaft, substantially as  
described.

Applicant has found that the driving shaft ar-  
rangement, herein described, with the means for lubricat-  
ing the same and protecting it from sand and water is  
applicable in many cases to underground work, and the a-  
bove claim is therefore inserted in order to protect said  
feature more broadly.

Respectfully submitted,

Mahlon E. Layne

By his attorney, *Paul Synnestvedt*

Div. 9. Room 142.

All communications should be addressed to

"The Commissioner of Patents,  
Washington, D. C."

Paper No. 8. J. L. D.

All communications respecting this application should give the serial number, date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,  
UNITED STATES PATENT OFFICE,

Washington, D. C., January 13, 1905.

Patent Office. Jan. 13, 1905. Mailed.

Mahlon E. Layne,

Care, Paul Synnestvedt,  
Pittsburg, Pa.

Please find below a communication from the EXAMINER in charge of your application, for Well Mechanism, filed April 28, 1903, Ser. No. 154,704.

This application has been considered as amended Dec. 23, and Dec. 31, 1904.

F. I. ALLEN,

Commissioner of Patents.

Claim 22 is allowed.

Claim 23 is rejected in conformity with the Commissioner's decision in *ex parte* Selle, 110 O. G., 1728, since this claim covers merely a lubricating shaft bearing and hence division will have to be required between this claim and the remaining claims in the case, applicant having already elected the invention before claimed.

F. M. TRYON,

Ex.

WHITEHEAD,

Asst. Ex.

*vs. Layne & Bowler Corporation.* 993

Mail Room. Oct. 24, 1905. U. S. Patent Office.  
Division 9, Paper No. 9. Oct. 25, 1905.  
U. S. Patent Office,  
Law Offices of

PAUL SYNNESTVEDT

Patents, Trade Marks, Corporations  
518 Frick Building 518 Monadnock Block  
Pittsburgh, Pa. — Chicago, Ill.  
Long Distance Telephones  
Cable Address PAULSYN

PAUL SYNNESTVEDT,

Counselor at Law and Expert in Mechanics.

PAUL CARPENTER,

Patent Attorney.

FRANCIS W. H. CLAY,

Attorney and Counselor at Law.

In re Application of M. E. Layne for Well Appa-  
ratus. Filed April 28, 1903. Serial No.  
154,704. (Room 142.)

Pittsburgh, Pa., October 23, 1905.

Hon. Commissioner of Patents,  
Washington, D. C.

Sir:

In response to the office letter of January 13,  
1905, the applicant amends by erasing claim 23.

Claim 23 is the only claim under rejection, so that  
this action puts the case in condition for allowances,  
and an immediate allowance is requested.

Respectfully,

MAHLON E. LAYNE,

By his Attorney,

PAUL SYNNESTVEDT.

154704

2—181.

Serial No. 154,704.

A. S. W.  
Issue Division,

All communications should be addressed to

"The Commissioner of Patents,  
Washington, D. C."DEPARTMENT OF THE INTERIOR,  
UNITED STATES PATENT OFFICE,

Washington, D. C., Nov. 6, 1905.

M. E. Layne,

c/o Paul Synnestvedt,

518 Frick Bldg.,

Pittsburg, Pa.

Sir: Your APPLICATION for a patent for an IMPROVEMENT IN Well Mechanism filed Apl. 28, 1903, has been examined and ALLOWED.

The final fee, TWENTY DOLLARS, must be paid, and the Letters Patent bear date as of a day not later than SIX MONTHS from the time of this present notice of allowance.

If the final fee is not paid within that period the patent will be withheld, and your only relief will be by a renewal of the application, with additional fees, under the provisions of Section 4897, Revised Statutes. The office aims to deliver patents upon the day of their date, and on which their term begins to run; but to do this properly applicants will be expected to pay their final fees at least TWENTY DAYS prior to the conclusion of the six months allowed them by law. The printing, photolithographing, and engrossing of the several patent parts, preparatory to final signing and seal-

IN REMITTING THE FINAL FEE GIVE THE SERIAL NUMBER AT THE HEAD OF THIS NOTICE.

the credit allowed is subject to the collection of the same. If payment is made by check or draft, the

ing, will consume the intervening time, and such work will not be done until after payment of the necessary fees.


When you send the final fee you will also send, **DISTINCTLY AND PLAINLY WRITTEN**, the name of the **INVENTOR** and **TITLE OF INVENTION AS ABOVE GIVEN**, **DATE OF ALLOWANCE** (which is the date of this circular), **DATE OF FILING**, and, if assigned, the **NAMES OF THE ASSIGNEES**.

If you desire to have the patent issue to **ASSIGNEES**, an assignment containing a **REQUEST** to that effect, together with the **FEE** for recording the same, must be filed in this office on or before the date of payment of final fee.

After issue of the patent uncertified copies of the drawings and specifications may be purchased at the price of **FIVE CENTS EACH**. The money should accompany the order. Postage stamps will not be received.

Respectfully,

**F. I. ALLEN,**  
Commissioner of Patents.

 After allowance, and prior to payment of the final fee, applicants should carefully scrutinize the description to see that their statements and language are correct as mistakes not incurred through the fault of the office, and not affording legal grounds for reissues, will not be corrected after the delivery of the letters patent to the patentee or his agent.

154704

JMH

Serial No. 154,704.

Issue and Gazette Division.  
All communications should be addressed to

"The Commissioner of Patents,  
Washington, D. C."

DEPARTMENT OF THE INTERIOR,  
UNITED STATES PATENT OFFICE,

Washington, D. C., May 4, 1906.

Mahlon E. Layne,  
c/o Paul Synnestvedt,  
518 Frick Building,  
Pittsburg, Pa.

Sir: Your application for a patent for an IMPROVEMENT IN WELL MECHANISM filed April 28, 1903, has been examined and again ALLOWED.

The final fee, TWENTY DOLLARS, in the above-entitled case was received May 4, 1906.

Very respectfully,

F. I. ALLEN,  
Commissioner of Patents.

154704

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2—327

\$20 Received May 4, 1906. Chief Clerk U. S. Patent Office.

MEMORANDUM  
of  
FEE PAID AT UNITED STATES PATENT  
OFFICE.

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(Be careful to give correct Serial No.)

Serial No. 154,704 1900.

Inventor: Mahlon E. Layne.

Patent to be Issued to Mahlon E. Layne.

Name of Invention, as Allowed: Well Mechanism.

Date of Payment: May 3, 1906.

Fee: Twenty dollars (check No. 1506).

Date of Filing: April 28, 1903.

Date of Circular of Allowance: November 6, 1905.

The Commissioner of Patents will please apply the accompanying fee as indicated above.

PAUL SYNNESTVEDT,  
Attorney.

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154704

No. 821,653.

PATENTED MAY 29, 1906.

M. E. LAYNE.  
WELL MECHANISM.

APPLICATION FILED APR. 28, 1903.

4 SHEETS-SHEET 1

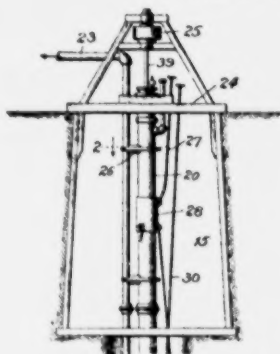
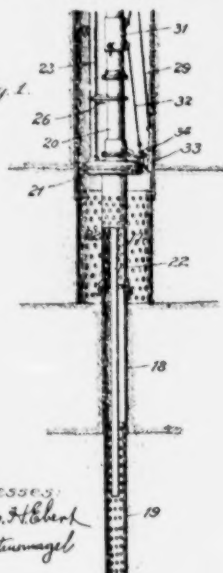


Fig. 1.



Witnesses:  
Chas. H. Clark  
Oscar Stummagel

Fig. 2.

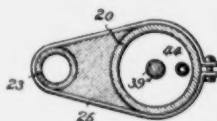


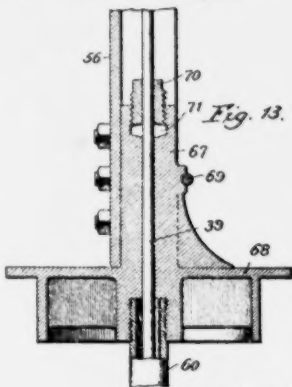
Fig. 3.



Fig. 4.



Fig. 13.



Inventor:

M. E. Layne

By Paul Lynnebrook



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Fig. 5.

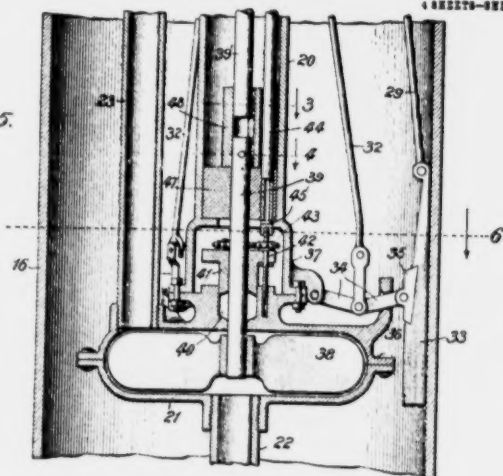
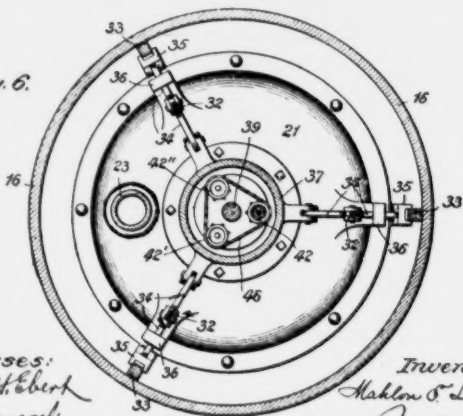


Fig. 6.



Witnesses:  
Chas. F. Ebert  
Oscar Steumagel

By

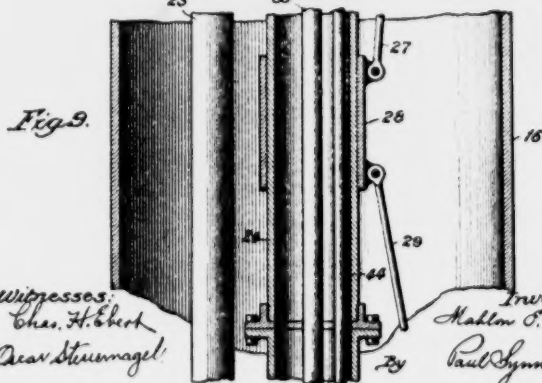
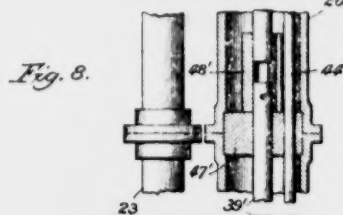
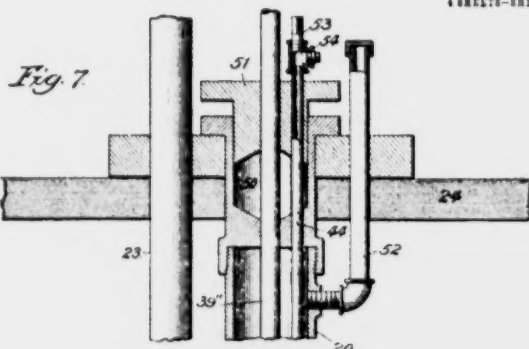
Inventor  
Maklon O. Layne  
Paul Lynne, Atty.

No. 821,653.

PATENTED MAY 29, 1906.

M. E. LAYNE.  
WELL MECHANISM.  
APPLICATION FILED APR. 28, 1903.

4 SHEETS—SHEET 2



Witnesses:  
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Oscar Steuermann

Inventor:  
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Paul Symmett  
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No. 821,853.

PATENTED MAY 29, 1906.

M. E. LAYNE.  
WELL MECHANISM.

APPLICATION FILED APR. 22, 1903.

4 SHEETS-SHEET 1

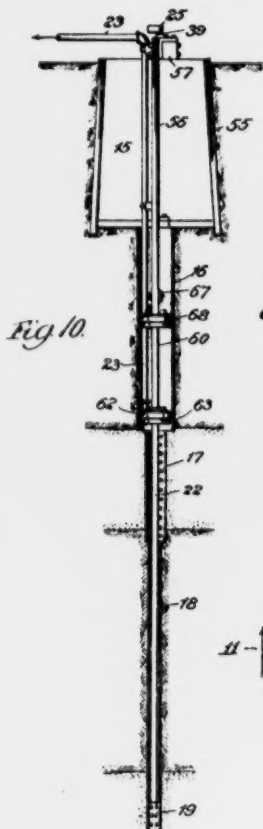


Fig. 10.

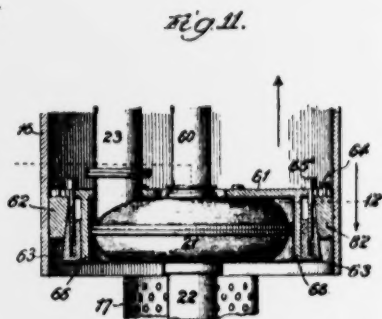


Fig. 11.

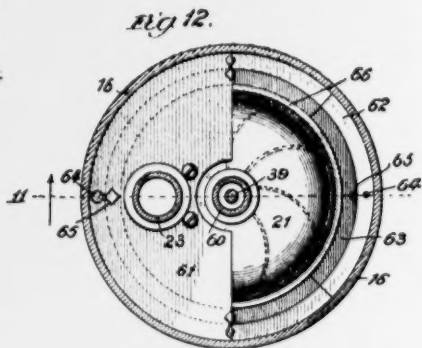


Fig. 12.

Witnesses:  
Chas. H. Ebert  
Oscar Steunagel.

Inventor:  
Mable T. Layne  
By Paul Synnott  
Att'y.

## UNITED STATES PATENT OFFICE.

MAHLON E. LAYNE, OF HOUSTON, TEXAS.

## WELL MECHANISM.

No. 821,653.

Specification of Letters Patent. Patented May 29, 1906.

Application filed April 28, 1903. Serial No. 154,704.

*To all whom it may concern:*

Be it known that I, MAHLON E. LAYNE, a citizen of the United States, residing at Houston, county of Harris, and State of Texas, have invented certain new and useful Improvements in Well Mechanism, of which the following is a specification.

My invention relates to the apparatus used for drawing water from driven or Artesian wells, and particularly to the means for adjusting a pump therein. The objects of the invention are, to provide means by which the piping and the pump may be all assembled in proper shape before inserting it into the well; to provide means by which a pump may be placed in any desired position in a well, centered, raised or lowered and fixed in position by manipulating from the outside entirely; to provide means for adjusting the length of the piping leading from the pump to the surface at will and to lower the pump from time to time without taking it out of the well; to provide improved means for centering and fixing the pump in proper position in the well casing; to provide improved means for manipulating the packing of the pump shaft, and proper adjustment of the pump in place by means at the surface of the ground; to provide for the proper action of a pump without stopping up the well, so that water may be either flowed into or pumped out of the same at pleasure; to provide a superior mounting for a centrifugal pump in the well, manipulated from the surface of the ground; to provide an extensible pump shaft separately supported at intervals along its length; to provide an automatic centering device for the pump in the well; to provide for mounting the pump and the shaft in a closed casing which is open to operate from the top; to obviate the necessity of making large wells for descending into them in order to arrange the pump, and to generally improve and cheapen the apparatus used for the above purposes.

The above objects, as well as other advantages which will hereinafter appear, I attain by means of the construction and assemblage of parts as illustrated in preferred forms in the accompanying drawings, wherein—

Figure 1 represents a section of a well showing the preferred form of my apparatus in place therein.

Figures 2, 3 and 4 are horizontal sections

of the shaft casing respectively taken on line 2 of Figure 1, and lines 3 and 4 in Figure 2.

Figure 5 is an enlarged central vertical section taken through the pump and the casing of the well.

Figure 6 is a horizontal section of Figure 5 taken along the line 6.

Figure 7 is a section of a top of the well casing containing the pump shaft and its mounting; Figure 8 is a similar section taken at one of the joints of the pump shaft casing.

Figure 9 is a section taken through the casing containing the pump shaft at the collar 28 in Figure 1.

Figure 10 is a vertical section of a well having a modified form of the apparatus therein.

Figure 11 is a side view and partial section of a centrifugal pump mounted by a modified method.

Figure 12 is a half plan and half section of the pump shown in Figure 11, taken along the line 12 therein.

Figure 13 is a partial vertical section taken through the shafting and its mounting shown in Figure 10 at the point marked 68.

For convenience of illustration the apparatus is shown as applied to a well which passes through two water bearing strata separated by an impervious stratum, the top surface of the ground being also an impervious layer of earth. The upper chamber 15 of the well may be protected by wooden framing as customary, or it may be but a continuation of the chamber inclosed by the casing 16, which may be carried to the surface if desired, and the chamber 15 dispensed with. Below this is a screen 17 in the sand layer, and still below the screen 17 is another casing 18, into which extends the suction pipe 22, from the pump 21, and below this another screen 19.

In the approved form as illustrated in Figure 1, I use a centrifugal pump 21, single or in a series, as may be desired, and having a top discharge. It is attached to a casing 20, which runs to the top of the well and incloses the driving shaft 39 of the pump, which may be driven by a pulley 25, mounted in the framework 24, in any approved manner. An outlet pipe 23 leads from the pump to the surface to carry off the water. As shown in Figure 2, the shaft casing 20, and the outlet pipe 23, are bound together by means of the block-and-strap arrangement 26. These connecting devices are distributed at intervals

along the length of the shaft casing. In order to previously assemble all the parts and then put the pump into the well and fix it in position therein, I provide a system of wedges 33, which serve to fix the pump in place and hold it in the proper vertical position, designed to be operated by means from the top of the well, avoiding the necessity of a man's going into the well in order to fix the pump in place. Pivoted to an extension on the head of the centrifugal pump casing 37, I provide a series of toggle links 34, which are carried in slots in the extension 36 of the casing, and at their outer ends bear wedge blocks 35, which embrace and cooperate with the vertically movable wedges 33, placed against the casing 16. The wedges 33 may be attached to links 29, which are carried by a sliding collar 28 on the casing 20, the collar 28 being operated by a rod 27, which runs to the top of the well, so that from the top the wedges 33 may be raised and lowered into place and can be tightened therein. The toggle links may be also connected by links 32, to a collar 31, and the collar 31 to a rod 30, which extends to the top of the well as before, in order to manipulate it without going into the well. Thus in order to obtain greater power and fix the wedges more securely in place, it will be observed that by pulling up on the rod 32, the toggle links 34 will cause the wedge blocks 35 to press with great power against the wedges 33, and thus fix the pump casing in place wherever desired.

The pump shaft 39 is inclosed in a shaft casing 20, which latter is made in joints and may be of any desired length. The pump shaft also is made in sections 39', 39'', 39''', which are attached together by means of sliding keys so as to allow of some vertical play with relation to each other. From Figure 5 it will be seen that the shaft 39 passes through a block 47, and at its top is fixed in the bearing block 48 by means of the pin 50, as shown in Figure 4. The next section of the shaft, 39'', is inserted into the block 48, and prevented from rotating by means of the key 49, which is splined therein. The weight of the shaft and pump below the block 47 is carried by the block 48; and from Figure 8 it will be seen that a similar arrangement is made at the top of the next section of the shaft casing, where the block 47' supports the weight of the section of shaft 39' by means of the collar 48', connected by a pin and key as before.

At the top, the casing 20 is closed and is provided with a stuffing box 50, closed by the cap 51, at the top of the shaft 39''. The shaft 39 is fixedly keyed to the vanes 38 of the centrifugal pump, and below the pump casing 21 is a pipe 22, which extends down below the water level and is extended any desired depth in the well.

The casing 20 also contains a tubular rod 44, which has a bearing in the block 47 on top of the pump casing 37, as shown in Figure 5, and is provided with a square opening which cooperates with the head of the screw 42, 70 used for adjusting the cap 41 of the packing box 40 for the pump, and compressing the packing in place. In order that this cap 41 may be raised and lowered evenly, the screw 42 is provided with a sprocket wheel, and 75 two other screws of a similar kind are distributed about the cap, as shown in Figure 6, and connected by means of the sprocket chain 46, so that by means of the tubular shaft 44, all three of said screws 42 may be 80 turned at once to compress the packing in box 40.

This pipe or tubular shaft 44 also serves the purpose of providing convenient means for forcing the liquid out of the pump shaft 85 casing. By forcing air in at the top of the casing 20, by means of the pipe 52, the liquid can be forced down to the bottom of said casing 20, and by means of the small opening 45, in the bottom of the tubular shaft 44, the fluid can be forced out at the top 54, and keep the casing clear in order to leave the bearings clean therein and not interfere with the working of the pump, or by forcing fluid in at the top 54, the operation will be reversed, and the fluid ejected from pipe 52. 95

It will be noticed that the weight of the pump and its shaft is supported at each end of the sections of the casing by the blocks 47, 47', etc. By reason of this arrangement the pump shaft and the shaft casing can be made in separable sections, and consequently the pump may be inserted at any desired depth and the parts assembled before putting them into the well. The wedge system illustrated for tightening the pump casing in place may also, if desired, be used to center it with respect to the casing. The outlet pipe 23 is also preferably made in sections to correspond with the sections of the pump shaft 110 casing.

In Figures 10 to 13 I have shown a modified form of the apparatus which uses a simple series of wedges for fixing the pump in place, as illustrated best in Figure 11. The pump casing has a platform 61, and a depending ring flange 66, and a series of wedges 63 are placed around the depending flange 66, and are connected to the top platform by means of a series of screws 65. A series of cooperating wedges 62 may also be provided, suspended from the platform 61 by means of the screws 64, and the two series of wedges surround the whole casing. It will sometimes be convenient to dispense with the outlet pipe 23, and extend the casing 16 to the top, to act itself as the conveying channel for the liquid. In each case, of course, the pump casing 21 and platform 61 will be made water-tight within the casing 16, and for this 134

purpose the wedges 62 will be made in overlapping sections, in order to break the joints seen in Figure 12. The pumps will then deliver directly into the upper casing. It will be plain that by turning the screws 65, the bottom wedges are drawn upward against the wedges 62, by which the casing of the pump is fixed in any desired place and tightened in the well casing 16. The screws 65 may be operated by means of a socket wrench placed upon a long rod and reached from the surface of the ground, or may be extended to the surface of the ground, as desired.

In the case illustrated, the top of the pump shaft may be provided with a pulley 25, as before, and a bearing fixed on some part of the framework, as on the cross beam 57. Extending downward from the beam 57 may be provided a timber 56, and part way down a bearing and support provided for the casing of the pump shaft 60, by means of the block 67, which is carried upon a cross frame 68; and a packing box therein, 71, is closed by a screw 70, the whole being attached to the timber 56 as shown in Figure 13. Below this point the shaft 39 may be inclosed in a casing 60, which is screwed in the block 67, as shown in said Figure. For additional security the block 67 may be attached to the timber 56, by means of the strap 69, which surrounds the same. The casing 60 may be in sections and of any desired length.

I prefer, generally, to allow for free flow of water down the well outside of the pump casing and the pump, in order that the water may be drained into the well when desired, rather than pumping the water out; which I attain by dropping the wedges 63 and thereby loosening the wedges 62 from the casing 16, permitting water above pump to pass into the strata supplying the well.

I generally prefer to extend the piping 22 entirely through the first water bearing stratum and into the second, as shown in the screen 19; it being understood that the water from the first stratum will flow down the casing 18 to the second when the water level falls sufficiently therefor.

In general I prefer the form of apparatus as shown in Figure 1, both because the means for fixing the pump in place is more easily adjusted, and because of the superior mounting of the pump shaft inside its sectional casing as therein shown, and making the pump shaft in sections. But in cases where the pump will not be moved for a long time, the device of Figure 11 may be used for wedging it in place.

It will be seen that by fastening the pump within the casing in such position as to leave an unobstructed passage around it, I provide for draining water into the well in cases where this is desired, as often happens when fields are flooded, and when it is desired to

drain the fields. The whole apparatus being self-contained, can be put together in proper form and lowered into the well at once. It will be seen also that the toggle levers used for actuating the wedges may be used or not, as desired, since the wedges alone will be amply sufficient in the apparatus of Figure 1, as well as in that of Figure 10. I consider it of great advantage also to arrange the pump shaft in a closed casing with stuffing box at surface of ground at top of pump, so that by the use of the packing boxes an air-tight chamber can be maintained, and water kept out of the casing 20, or kept filled with clean liquid, if desired, thereby providing an efficient lubricating system for all bearings of the pump.

The many advantages of this apparatus will be apparent to those familiar with the use of such devices, from inspection of the drawings.

Having thus described my invention and illustrated its use, what I claim and desire to secure by Letters Patent, is the following:

1. A pump provided with a closed driving shaft casing extending to the top of the well from the pump, a pipe extending downward from the pump casing and means for fixing the pump at any desired point in the well casing, substantially as described.

2. A pump provided with a closed driving shaft casing extending to the top of the well from the pump, a pipe extending downward from the pump casing and means for fixing the pump at any desired point in the center of the well casing and sealing said shaft off from water in the well, substantially as described.

3. The combination with a pump of an extensible pump shaft therefor means for supporting the pump at any desired point in the well, and independent supports for the shaft.

4. The combination of a rotary pump, and extensible pump shaft and protecting casing for the shaft, and means for supporting the pump and shaft and casing at any desired point within the well.

5. The combination with a rotary pump, of a sectional pump shaft casing surrounding the pump shaft and extending to the top of the well and means for fixing the pump in position at any desired point of the well casing.

6. In well mechanism in combination with a pump, a series of wedges operated from the top of the well by means of links, a series of wedges carried by the pump casing and operated by toggle links attached to a rod extended to the top of the well, for the purposes specified.

7. In combination with a well casing and a pump, a series of wedges suspended by rods from the top of the well for operating the same to wedge the pump casing against the well casing, substantially as described.

8. In well mechanism a pump casing provided with a series of wedges mounted upon toggle links therein to wedge the said casing against the side walls of the well casing, substantially as described.

9. In well mechanism the combination with a pump casing, of a rotary pump of a jointed pump shaft and a closed casing surrounding the pump shaft from the pump to the top of the well.

10. In well mechanism in combination with a pump and a closed shaft casing, a pump shaft supported at intervals by blocks pinned thereto and having splined joints in said blocks whereby the different sections of the pump shaft may have vertical play with relation to each other.

11. A pump casing provided with a stuffing box and stuffing box plug, a closed shaft casing protecting the bearings from the water screws for raising and lowering said plug and means for moving all of said screws at once and means for operating the screws from the top of the well, substantially as described.

12. In pump mechanism the combination with wedges for fixing the pump in the well casing, of a casing for the pump shaft, a collar thereon and links extending from said collar to the top of the well and to the said wedges.

13. The combination with a pump and its actuating shaft of a sectional casing therefor provided at each end of each section with a fixed block with bearings for the shaft, the casing being closed at the top and provided with an air vent.

14. The combination with a pump of a pump shaft casing closed at the top and bottom and provided with an interiorly disposed hollow rod for the escape of liquid from the shaft casing and an air inlet at the top of the casing.

15. In well mechanism the combination with a rotary pump of a pump shaft made in sections independently supported and joined by blocks and keys in the blocks and ends of

the shaft sections, and a closed casing around the shaft.

16. A pump shaft made in sections, each section being suspended on a bearing by means of a block pinned to the shaft section and the next section being splined into said block to rotate therewith.

17. The combination of a rotary pump, of a pump shaft and shaft casing surrounding the shaft, the shaft and casing being in sections and connected by bearings at each end, and the shaft section being separately supported in each section of the casing, as described.

18. In well apparatus the combination with a pump and means for suspending it from the top of the well, of a casing separating the pump and bearings from the well, and devices for fixing it at any desired point in the well casing, and means for operating the fixing devices from the top of the well.

19. A pump shaft made in independently supported sections and suspended in a closed pipe and provided with bearings and means for lubricating the same.

20. The combination of a well casing, a rotary pump therein, and a line shaft for the pump entirely closed off from the water in the well.

21. The combination of a well casing, a rotary pump therein, means for fixing it at any desired point in the well, an extensible line shaft for the pump and a shaft casing entirely inclosing the shaft and bearings.

22. The combination of a well casing, a rotary pump therein, means for fixing it at any desired point, a shaft casing, and a discharge outlet from the pump independent of the shaft casing and communicating with the pump casing only at the bottom of the well.

In testimony whereof I have hereunto set my hand, this 3d day of April, A. D. 1903, at Chicago, Illinois.

MAHLON E. LAYNE.

Witnesses:

PAUL CARPENTER,  
ALBERT C. HOWARD.

2—421.      DIVISION IX.

1903

CONTENTS:

Print. ....

Application O. K. papers.

1. Rej. June 1/03.
2. Amendt. A, Feb. 1, 1904.
3. Rej. Feb. 15/04.
4. Amendt. B, Dec. 9, 1904.
5. Rej. Dec. 20/04.
6. Amendt. √ Dec. 23, 1904.
7. Amendt. C, Dec. 31, 1904.
8. Rej. Jan. 13/05.
9. Amendt. √ Oct. 24, 1905.
10. ....
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23. ....

TITLE:

Improvement in Well Mechanism.

Class 103—PUMPS.

Rotary Single Piston.

154,704.



*vs. Layne & Bowler Corporation.* 1007

[Endorsed]: No. 485—Eq. Layne & Bowler Corpn. vs. Western Well Works et al. Defts. Exhibit "D." Filed Sept. 3, 1920. W. B. Maling, Clerk. By J. A. Schaertzer, Deputy Clerk.

No. 3627. United States Circuit Court of Appeals for the Ninth Circuit. Filed Jan. 6, 1921. F. D. Monekton, Clerk.

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**Defendants' Exhibit "E."**

In the District Court of the United States for the  
Western District of Louisiana.

No. 925—IN EQUITY.

MAHLON E. LAYNE et al.,

Plaintiff,

vs.

FRED I. GETTY,

Defendant.

**OPINION.**

This is a suit brought by Mahlon E. Layne, patentee, and Layne & Bowler Company, his licensee, for infringement of patent, with the usual prayer for injunction, and an accounting for damages and loss of profits. A preliminary injunction was refused, and on appeal the ruling was affirmed without prejudice on final hearing (222 Fed. 918).

The object of the patent in controversy is a pumping apparatus for use with a rotary pump in a drilled well, designed primarily for irrigation pur-

poses. The invention claimed is not in the pump itself, but in the apparatus for the protection, lubrication and alignment of the revolving shaft through which the power is transmitted from the surface of the ground to the blades of the pump near the bottom of the well. From this rotary or centrifugal pump, a pipe for discharging the water leads to the ground, and this pipe and the shaft from a point immediately above the pump are inclosed in a metal casing extending from the pump casing to the surface.

In this shaft casing bearings spaced about six feet apart, and at each end, where the shaft passes out of the casing, the specifications of the patent call for an air tight packing box. This packing box, however, has long since been abandoned and a sleeve bearing, or bushing, is used in its place. The shaft is oiled at the end above ground, and the oil passes from bearing to bearing on down to the end of the shaft where it escapes through the last sleeve bearing or bushing, the clearance between the shaft and the bushing being sufficient to permit the passage of the oil. The patent originally provided a method of forcing the oil out of the casing from time to time by air pressure, but this is not found necessary in actual use, since the substitution of the bushing for the packing box. The effect of the constant feeding of oil during the operation of the pump is to cause a pool to collect above each of the bearings and the pressure of this head of oil through the bearings and the bushing at the bottom of the shaft keeps the water from

entering. Thus, the casing is practically a closed one against the entrance of dirt and sand which would cut and wear out the bearings. These bearings further serve the purpose of holding in a straight line the shaft which otherwise would have a tendency to bore out, or whip, when revolving at high speed. These functions of the apparatus, lubrication, protection and alignment, it is claimed, are infringed by similar construction in the Getty pump. The specifications covering the features of the patent alleged to have been infringed are numbers 9 and 20, which read as follows:

“9. In well mechanism the combination with a pump casing, of a rotary pump, of a joined pump shaft and a closed casing surrounding the pump shaft from the pump to the top of the well.

20. The combination of a well casing, a rotary pump therein, and a line shaft for the pump entirely closed off from the water in the well.”

These two specifications, as held by the Court of Appeals in *Van Ness vs. Layne* (213 Fed. 804), are in effect the same, the only difference being that in number 9, a jointed shaft is called for. No infringement, however, is claimed because of defendant's use of a jointed shaft. Consequently, the two specifications may be regarded as one and the same.

The defendant in answer first denies the validity of the patent, and second, denies, if the patent is valid, that the Getty pump is an infringement. It is claimed by defendant that several prior inven-

tions, and particularly the Crannel pump, patented several years before the Layne pump, embraced substantially the same features as Layne's patent, and so anticipated the latter.

In the suit of Layne vs. El Campo Machine Company, from the Southern District of Texas (195 Fed. 83), involving this patent, the Circuit Court of Appeals, Fifth Circuit, modified the decree of the lower court sustaining the validity of claims 9, 13, 20 and others of the patent, by striking out the finding of infringement as to all of the claims except 13. The validity of claims 9 and 20 was not passed on, but these claims were held not to have been infringed.

Subsequently, in the case of Layne vs. Van Ness, this court sustained the validity of claims 9 and 20 and held them infringed by the Van Ness pump. The decree was affirmed by the Court of Appeals (213 Fed. 804). The contention in the Van Ness case, as in the case at bar, was that claims 9 and 20 of the Layne patent were invalid, having been in effect, covered and anticipated by the Crannel pump, previously patented.

The Crannel apparatus, which was not a commercial success, provided for a closed casing around the shaft transmitting power to a rotary pump, but did not provide intermediate bearings along the line of the shaft. This absence of intermediate bearings is practically the only difference in principle between the two mechanisms in so far as claims 9 and 20 are concerned. It is urged by the defendant that the adding of intermediate bearings

to prevent the shaft from whipping does not involve invention; that it is something that would occur to anyone skilled in the art, and that, likewise, the method of oiling by letting the oil run down from bearing to bearing, would occur to anyone, and had always been the method of oiling vertical shafts.

The Court is much impressed with this argument. The insertion of additional bearings to prevent whipping of the shaft where the distance between bearings is too great, is as simple and natural a thing to do as the putting in a fence of extra posts to prevent sagging of a barbed wire, where the posts of the panels are too far apart. Were the question a new one, I should be inclined to hold the patent invalid, but the same issue was raised and directly passed on by this Court and by the Court of Appeals for this circuit, in the Van Ness case sustaining the patent.

It is contended by the defendant herein that the evidence in the Van Ness case was to the effect that the Crannel pump would not work, whereas, by physical demonstration on the trial of this case, the contrary was shown, and the court therefore should not feel bound by the ruling in the Van Ness case. The opinion in the Van Ness case, however, does not appear to have been based on the evidence that the Crannel patent would not work. The Court held:

“1. It seems quite clear that the idea of a protected casing of a pump shaft without restrictive interpretation would contain no

novelty and would not be patentable, and, if this element in the patent is given the unrestricted meaning that its language admits of, it would destroy the claim. The contention of the defendant is that it should be given the unrestricted generic meaning suggested by its broad language, and that of complainant, that the specifications should be looked to to interpret the claim, and that it should be held to mean only a protective casing of the kind and with the functions set out in the specifications. It seems that the complainant's contention is supported by the authorities cited in his supplemental memorandum and that the argument that the patent granted by the Government should be construed so as to prevail rather than be forfeited, since that must have been the intention of the Patent Office, is a sound one, for limiting the breadth of the language of the claim to the disclosure of the specifications of the patent, if necessary to sustain the patent. If so limited, it would seem that the protective casing intended to be covered by the claim was one of the kind described in the specifications and having the three functions attributed to it by the specifications, namely:

- (1) To exclude water and detritus from the shaft and its bearings;
- (2) to provide a means of lubricating the bearings of each section of the shaft from the top of the well without removing the apparatus from it; and
- (3) to align the bearings and the shaft so as to prevent

lateral displacement in the well and keep the shaft in a vertical position.

2. Giving the claim this significance, it fairly appears from the record, as we see it, that there was no protective casing in the prior art of the kind and with the functions of that of the patent in suit. It also seems fairly to appear from the record that such a protective casing as that set out in the specifications contained novelty enough to constitute invention."

Accepting the view of the Court of Appeals as to the validity of the patent, there is left only the question of infringement. The structure of the Getty pump consists of a shaft with casing held in alignment by bearings and connected with a rotary pump resting on the bottom of the well. The shaft is oiled in practically the same manner as the Layne pump shaft, the oil passing on down the line of the shaft from bearing to bearing and past the last sleeve bearing to the outside. The chief difference urged is that the shaft casing in the Getty apparatus, is not entirely closed; that no packing box is used, as provided in the Layne patent; and, therefore, that there is no infringement. While it is true that water might ordinarily pass up between the bushing or sleeve bearing, and the shaft while the pump is not in action, when it is in operation, and the oil is being constantly fed in at the top of the shaft, the weight of the column of oil pressing downward between the shaft and the bushing, would keep the water out, just as in the case of the

Layne pump, except in small quantities. The same contention was thus disposed of in the Van Ness case:

“If the idea is considered patentable, the last question is whether the defendant’s pump infringes; that is, whether his pump contains the element of a closed shaft casing in the sense to be attributed to that element in the claim of the patent in suit, i. e., one of a kind described in the specifications of the patent and having the same three functions. The defendant denies that his pump shaft casing performs any one of the three functions attributed to that of the patent in suit. He denies that it is a closed casing in any true sense. It seems not to be closed so far as concerns the entrance of air. However, the proper interpretation of the words ‘closed casing’ is a closure only against what is necessary to be excluded for the successful operation of the invention, and that, in this case, as we understand it, is water and sand, because when not excluded the first corrodes and the second wears the shaft and its bearings. It seems also true that the closure against water is only partial, since the lower bearing of defendant’s apparatus is not within the inclosing casing, though the intermediate and top bearings are. So it seems doubtful whether the defendant’s pump casing keeps the water from the shaft and bearings when it is not in operation, and the argument is that in the rice country, where it is principally used,



it remains out of service nine months of the year. For these reasons, it is argued that the defendant's casing is not a closed one, even against water and sand. However, the record shows that protection against water and sand is afforded by defendant's casing to all but one of the bearings and to the shaft in the same degree as by that of the patented casing, at least during the period of the pump's operation, and that the protection afforded by defendant's casing is different only in degree from that afforded by the patented casing. The closure in the patented casing is effected by stuffing boxes as well as by the presence and downward pressure of the oil between the bearings and the shaft, which serves to keep the water from pressing upward into the shaft casing between the bearings and the shaft. The closure in defendant's casing is effected by the last method only, and without the use of packing or stuffing boxes. Each casing serves to affect at least a partial closure against the water and sand. The difference is one of method and degree only, and for that reason it seems that the defendant's casing infringes this element of the patent, at least to some extent."

There is this difference between the Van Ness and the Getty apparatus. In the former the weight of the shaft is largely sustained by a thrust bearing near the bottom of the casing, so that the pressure on the thrust bearing would tend to make

the casing nearer water proof. In the Getty apparatus, which rests on the bottom of the well, there are no thrust bearings, but all the bearings are of the ordinary kind, so that, as argued by counsel, more water would pass into the shaft casing of the Getty pump than into that of the Van Ness pump. Each casing, however, as was said by the Court of Appeals in comparing the Van Ness and the Layne casing, "serves to affect at least a partial closure against the water and sand. The difference is one of method and degree only."

As stated by the Court in the Van Ness case, the questions both as to patentability and infringement are close ones. The evidence on the first question is practically the same in the case at bar as in the Van Ness case, and on the second question, I think there is no substantial difference in the features of the Van Ness and Getty pumping apparatus as to which infringement is claimed.

Following the ruling in the Van Ness case, specifications numbers 9 and 20 must be held to be valid and to be infringed by defendant's pump.

A decree will therefore be entered ordering an injunction as prayed for and an accounting for damages and loss of profits.

GEO. WHITFIELD JACK,  
Judge.

[Endorsed]: No. 925. U. S. Dist. Court, West. Dist. of La. M. E. Layne et al. vs. Fred I. Getty. Opinion of Court. Filed Feb. 15, 1919, 11:22 A. M. W. B. Lee, Clerk, U. S. District Court, West. Dist. of Louisiana.

CERTIFICATE OF CLERK OF COURT.

United States District Court, Western District of  
Louisiana.

Clerk's Office:

I, W. B. Lee, Clerk of the United States District Court for the Western District of Louisiana, do hereby certify that the foregoing seven pages, numbered from one to seven, inclusive, contain a true, full and correct copy of opinion of court in a cause entitled Mahlon E. Layne et al., versus Fred I. Getty, No. 925 on the docket of said court, as the original of same appears on file in this office.

WITNESS my hand and seal of office, at the City of Shreveport, Louisiana, on this the 12th day of March, A. D. 1919.

[Seal]

W. B. LEE,

Clerk United States District Court for the Western  
District of Louisiana.

[Endorsed]: No. 925. United States District Court, Western District of Louisiana. Mahlon E. Layne et al. vs. Fred I. Getty. Opinion of Court. Copy Certified Under Seal. Filed Feb. 15, 1919, 11:22 A. M. W. B. Lee, Clerk United States District Court, for the Western District of Louisiana.

No. 485—Eq. Defts. Exhibit "E." Filed Sept. 3, 1920. W. B. Maling, Clerk. By J. A. Schaertzer, Deputy Clerk.

No. 3627. United States Circuit Court of Appeals for the Ninth Circuit. Filed Jan. 6, 1921. F. D. Monckton, Clerk.

**Defendants' Exhibit "F."**

[Endorsed]: No. 485—Eq. Layne & Bowler Corp'n. vs. Western Well Wks. et al. Defts. Exhibit "F." Filed Sept. 3, 1920. W. B. Maling, Clerk. By J. A. Schaertzer, Deputy Clerk.

No. 3627. United States Circuit Court of Appeals for the Ninth Circuit. Filed Jan. 6, 1921. F. D. Monekton, Clerk.

(No Model)

S. N. EISLER.  
ROTARY PUMP.

**No. 522,518.**

Patented July 3, 1894.

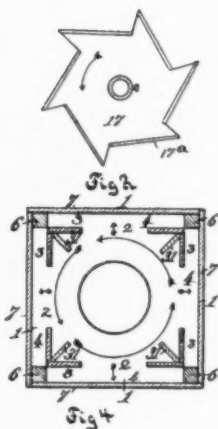
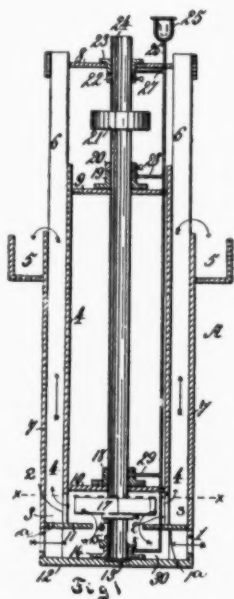


Fig. 3.

Witness  
Robert C. Rice.  
Sidney E. Crook.

Inventor.  
Stephen E. Eister.

By Walter H. Cook  
Attorney.

may be found, one to twelve in the water flowing from each conduit or passage 3, or one conduit from each conduit extending around the casing 10 and 11. A may be provided. This trench or trough receives the water from the conduits 3, and through 22 is conveyed

## UNITED STATES PATENT OFFICE.

STEPHEN N. EISLER, OF NEW ORLEANS, LOUISIANA, ASSIGNOR OF  
ONE-HALF TO JOHN D. BELTON AND SHAKESPEAR & SWOOP,  
OF SAME PLACE.

**ROTARY PUMP.**

SPECIFICATION forming part of Letters Patent No. 522,518, dated July 3, 1894.  
Application filed June 15, 1893. Serial No. 477,745. (No model.)

*To all whom it may concern:*

Be it known that I, STEPHEN N. EISLER, a citizen of the United States, residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented certain new and useful Improvements in Rotary Pumps; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

My invention relates to certain improvements in rotary pumps, and has for its objects to provide a novel construction and combination of parts whereby the forcing of the water upward to the point of delivery is insured, and to provide novel means for oiling or lubricating the parts of the structure without dismemberment and while in operation.

To these ends my said invention consists in the novel construction and combination or arrangement of parts hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figure 1, is a vertical section of a pump constructed in accordance with my invention. Fig. 2, is a bottom plan view of the lift and force piston. Fig. 3, is a top plan view of the same, and Fig. 4, is a sectional view, taken on the line  $x-x$ , the piston being shown in dotted lines.

In the said drawings, the letter A, indicates the pump-casing or framing, which is composed of a bottom or base-piece 12, from the four corners of which rise standards or beams 6, secured to which are interior and exterior walls 4 and 7, which are separated from each other to provide water-passage-ways or conduits 3, of which four are shown in the drawings, (see Fig. 4.) The interior walls 4, extend upward beyond the exterior walls 7, as in Fig. 1, to prevent the water passing up the conduit 3 from overflowing into the interior of the casing or framing A.

Secured to the exterior walls 7, at or near their top edges is a trough 5, of which there may be four, one to receive the water flowing from each conduit or passage 3, or one continuous trough extending around the casing A may be provided. This trough or troughs receive the water from the conduits 3, and

may be suitably connected with means of conveyance, (not shown herein and forming no part of the invention,) for carrying the water to any desired point of use.

The numeral 24, designates a shaft vertically arranged within the pump-casing A. At its lower end, this shaft rests upon a steel plate 13, set into the base-piece 12, and revolves or rotates in a bearing 14.

A collar or cap 15 is secured by a set-screw to the shaft 24, and lies upon the top edge of the bearing 14, preventing the access of sand or other foreign matter to the bearing of the shaft. The shaft is supported and steadied laterally by floors or partitions 8, 9 and 10, arranged at suitable intervals vertically, and provided with openings through which the shaft 24 passes, and bearings 19 and 23, arranged in connection with the floors or partitions 8 and 9. In order to retain the shaft in proper vertical position for operation and prevent any vertical movement which might otherwise be induced by the work performed, I firmly secure collars 20 and 22, to the shaft by set screws said collars being arranged in contact with the bearings 19 and 23, as shown in the drawings, one of said collars being arranged above the bearing 19, and the other below the bearing 23; in this manner it will be seen that the shaft is prevented from any vertical displacement or movement.

In prior pumping-apparatus it has been difficult and inconvenient to lubricate the bearings of the propelling shaft, since it was essential that parts of the structure be removed for that purpose. By my invention, I avoid the inconvenience and provide a novel lubricating means by which the shaft-bearings can be lubricated automatically so long as the supply of oil lasts, and whereby oil can be supplied without dismemberment of the apparatus, said means consisting of a vertical pipe 26, arranged interiorly of the pump-casing as shown and communicating at its upper end with the outlet of an oil supply-cup 25.

Branch pipes 27 extend from the vertical pipe 26 and lead to the shaft-bearings 14, 18 and 22, so that the oil or lubricant is automatically fed to said bearings. The oil supply-cup 25 is arranged so that oil can be

placed therein without taking apart the casing or any of the supports of the shaft.

A water-inlet opening 1, is provided at the bottom of the casing A, which extends on all sides of said casing, and extending inwardly in said casing immediately over said opening is an intercepting-plate 1a, above which an opening 2, is provided in the inner wall 4, of the casing, leading to the passage or conduit 3.

The numeral 17, designates a combined lift and force piston which is secured to the shaft 24, so as to rotate therewith, by means of a set screw, or in any other suitable manner said piston being located in the compartment formed by the partition 10 and the intercepting plates 1a, the form thereof being illustrated in Figs. 2 and 3, wherein it is shown as a solid piece of material, the periphery or edge being shaped or formed into a series of inclined pushing surfaces 17a. The shaft 24 is rotated by means of a belt (not shown), running upon the pulley 21, and driven from any suitable source of power. When the shaft 24 is rotated, the piston 17 is also rotated in the direction shown by the arrows, Fig. 4, and by its action draws water in through the opening 1, lifts it up around the intercepting plates 1a and by means of the inclined pushing faces 17a forces it radially outward into the passage or conduit 3 through the opening 2, the water being guided into or compelled to enter the passage 3, by cut-offs 31, located at the four corners of the casing in the same horizontal plane with the openings 2. In the absence of these cut-offs the water would probably travel around with the wheel in a horizontal direction, but by their employment said water is compelled to

enter the passage or conduit 3, and the continued operation of the pan forcing water into said conduit causes the water to rise until it overflows into the trough 5, from whence it may be conveyed, if desired, to any other point for use.

The piston 17, is arranged in a compartment whose roof is formed by the partition 10, which prevents the passage of water up into the interior of the casing A, compelling the water to pass through the opening 2, into the passage or conduit 3.

Having thus described my invention, what I claim is—

In a rotary pump, the combination of a casing A, having inner walls 4 and outer walls 5 7, forming a water conduit 3, the walls 4 extending above the walls 7, the trough 5 arranged beneath the top of the walls 7, a rotatable shaft 24 supported vertically in said casing, a piston 17 carried by said rotatable shaft and having its lower edge formed into a series of inclined pushing or deflecting surfaces 17a, a partition 10 located in said casing immediately above said piston, an intercepting plate 11 arranged beneath the piston and provided with inlet ports 2, a water inlet 1 formed in the outer wall 7 inlets 3 formed in the walls 4 opposite the periphery of the piston, and radially disposed cut-offs 31 arranged between the inlets 2, substantially as shown and described.

In testimony whereof I have hereunto subscribed by name in the presence of two witnesses.

STEPHEN N. EISLER.

Witnesses:

ROBT. E. RIES,  
SIDNEY G. COOK.

**Defendants' Exhibit "G."**

[Endorsed]: No. 485—Eq. Defendants' Exhibit "G." Filed Sept. 3, 1920. W. B. Maling, Clerk. By J. A. Schaertzer, Deputy Clerk.

No. 3627. United States Circuit Court of Appeals for the Ninth Circuit. Filed Jan. 6, 1921. F. D. Monckton, Clerk.



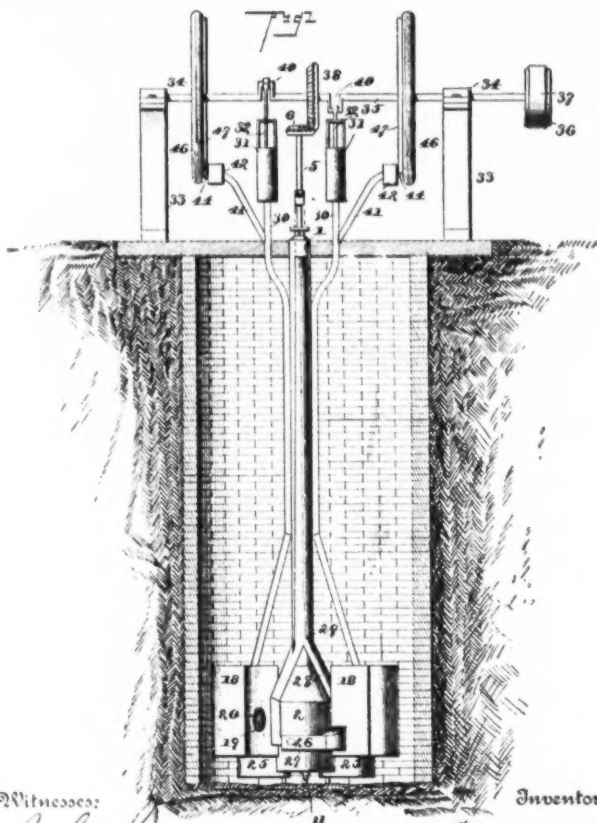
(No Model.)

2 Sheets—Sheet 1.

C. W. CRANNELL.  
COMPOUND PUMP.

No. 425,933.

Patented Apr. 15, 1890.



Witnesses:

Inventor

*John Minie*  
*W. S. Dewar*

*Charles W. Crannell*

By his Attorneys

*Cashner & Co.*

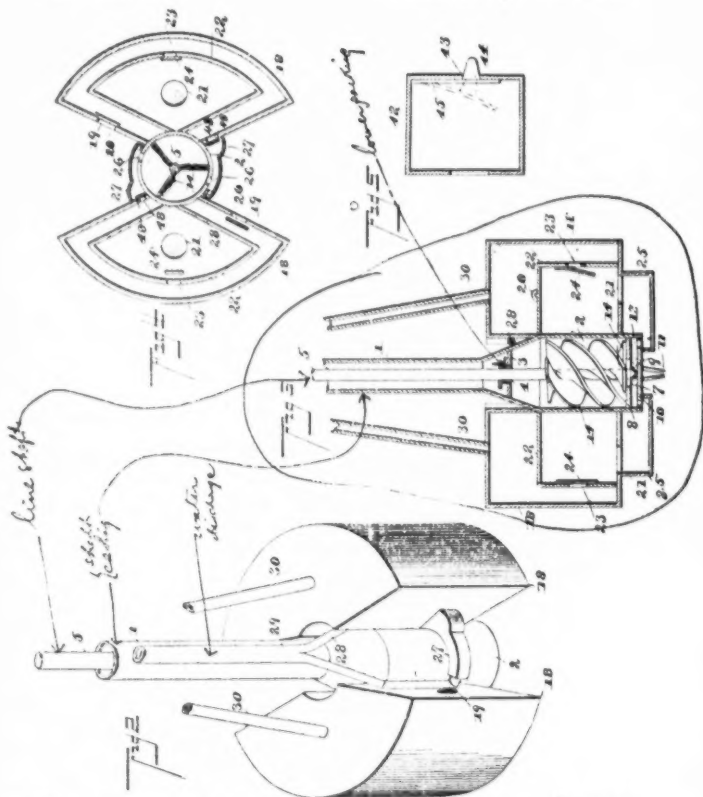
(No Model.)

2 Sheets—Sheet 2.

C. W. CRANNELL.  
COMPOUND PUMP.

**No. 425,933.**

Patented Apr. 15, 1890.



Witnesses:

Witnesses:  
John Smilie  
W S Swall.

Inventor

Charles W. Crammell

By this Attorneys

Cañon de los

UNITED STATES PATENT OFFICE.

CHARLES W. CRANNELL, OF OBERLIN, KANSAS, ASSIGNOR OF ONE-HALF  
TO FLOYD W. CASTERLINE, OF SAME PLACE.

COMPOUND PUMP.

SPECIFICATION forming part of Letters Patent No. 425,933, dated April 15, 1890.

Application filed December 12, 1889. Serial No. 333,466. (No model.)

all whom it may concern:

Be it known that I, CHARLES W. CRANNELL, a citizen of the United States, residing at Oberlin, in the county of Decatur and State of Kansas, have invented a new and useful Compound Pump, of which the following is a specification.

This invention has relation to compound pumps; and the objects and advantages of the same, together with the novel features thereof, will hereinafter appear, and be particularly pointed out in the claims.

Referring to the drawings, Figure 1 is a vertical section of a well provided with a pump constructed in accordance with my invention. Fig. 2 is a perspective view of the pump; Fig. 3, a vertical longitudinal section; Fig. 4, a transverse section through the pump-cylinder; Fig. 5, a detail in perspective of one of the air-escapes.

Like numerals of reference indicate like parts in all the figures of the drawings.

The hereinafter-described pump is designed to be operated by any suitable motor, and is especially adapted for use in dry countries for irrigating purposes, wherein it is desirable to throw continuous, steady, and large streams over the surrounding territory.

Further objects of the invention are to accomplish the above result with a pump so constructed as to be capable of production at a reasonable cost, which shall consist of few easily manufactured and assembled parts and which shall be very powerful in its operation and capable of operation with a minimum amount of motive power.

Numerous other objects will appear, and I do not herein wish to limit my invention to the exact arrangement and construction of the details shown, as various changes wholly within the scope and spirit of my invention may be readily practiced by those familiar with this class of invention.

1 represents the pump-stock, which is of any ordinary construction and at its lower end merges into a cylinder 2 of considerably greater diameter than the stock, and from which is divided by a diaphragm 3, having a central perforation 4, through which is inserted the pump-rod 5, which passes up

through the stock. At this point it is properly packed and is provided at its upper end with a small pinion 6. The lower end of the rod passes through an opening 7 in the false bottom 8, located at the lower end of the cylinder 2, and the extremity of said rod takes bearing in a step 9, projecting upwardly from the true bottom 10 of the cylinder, which bottom is provided with a series of feet 11 for elevating the pump above the bottom of the well in which the pump is located, as shown in Fig. 1. Between the false and true bottoms of the cylinder there is formed a suction-chamber 13, which chamber, through the opening 7, has direct communication with the cylinder 2, and within the later cylinder and mounted over the opening 7 and upon the pump-rod, which is rotatable, there is a series of triple-bladed screws 14. The blades of these screws are arranged in a series of three, each radiating from the rod in the form of three spirals arranged equidistant on the rod and extending spirally around the rod from the top to the bottom of the cylinder, so that any water introduced into the suction-chamber will be drawn up into the cylinder 2, when said blades are rotated at a proper speed, and exhaust the air within the cylinder, and water thus drawn up will be caught by the blades and thrown toward the wall of the cylinder, and consequently through any opening that may be formed therein, and which will be hereinafter described.

At diametrically-opposite sides of the cylinder 2 are located induction-chambers 18, which are each provided with an opening 19, covered by inwardly-opening valves 20. Each of the induction-chambers is also provided with an opening 21 in its bottom, which is covered upon its inside by an internal chamber 22, mounted within the induction-chamber, which internal chamber is provided with an opening 23, communicating with the induction-chamber, which is covered by an inwardly-opening valve 24. Passages 25 inclose the openings in the bottoms of the induction chambers and communicate at diametrically-opposite sides with the suction-chamber in the bottom of the cylinder 2.

The wall of the cylinder 2 at diametrically-

opposite points and between the two induction-chambers is provided with eduction-ports 26, and communicating with the same and secured to the cylinder are eduction chambers 27, from each of which there leads an eduction-pipe 28, said pipes meeting above the cylinder 2 and merging into a common discharge-pipe 29, from which the water is discharged in any suitable manner or conducted to any suitable point from the same. From each of the induction-chambers there leads to the top of the well air-pipes 30, the upper ends of which communicate with independent air-pumps 31, designed to be alternately operated.

Any mechanism desired may be employed for rotating the pump-rods and alternately reciprocating the pistons 32 of the pump-cylinders, and I will herein describe a simple means for accomplishing the same.

At each side of the curbing of the well there is located a standard 33, provided upon its upper end with a bearing 34, in which there is journaled a transverse shaft 35, extending across the pump. A pulley 36, driven by a belt 37, leading from any motor, rotates the shaft, and a gear 38, mounted upon the center of the shaft, meshes with and operates the small pinion at the upper end of the pump-rod. Cranked portions 40 are formed in this power-shaft, the cranks being oppositely disposed, and each is connected to the upper end of one of the pistons of the air-pumps, so that when one piston is upon the downstroke the other piston is upon the reverse or upstroke, whereby the induction-chambers of the pump will be alternately filled with air in a compressed state. Each of the air-pipes below its pump is provided with a short section or branch pipe 41, which terminates at its outer end in an air-chamber 42, having an opening 43 at its front normally covered by a gravity swinging valve 45, having a lug 44 projecting outwardly from the front face of the valve through the opening in the chamber. At each side of the pump-cylinders, upon the power-shaft, I mount ordinary fly-wheels 46, which while performing their well-known functions also perform another function, which I will now proceed to describe. Each wheel has its inner face provided with a peripheral cam or flange 47, which flange extends one-half the distance around the wheel, and the flange of one wheel occupies a half of its wheel opposite that half of the other wheel occupied by the other flange, so that when the flange of one wheel is in the upper portion of the circumferential path traveled by the same the lower flange is in the lower half of said path. These wheels are so located with relation to the small air-chambers projecting from the air-pipes that when the flanged halves of the same are in the lower portion or half of their circumferential path the flanges or cams are in contact with the lug or stud upon the gravity-valve, thus pressing the same inward and permitting any air in the induction-chamber with which the

air-pipe communicates to escape. It will be apparent, also, that these flanges are arranged in proper relation with the cranked portions of the shaft operating the piston, so that said valves will be operated at the times that the pistons are on their upstroke.

The operation of my invention may be briefly stated as follows: The machinery being started, one of the induction-chambers will be exhausted and water drawn into the same from the well, which water will be a downstroke of the pump-piston connected with this chamber be forced by compressed air into the internal chamber located within the induction-chamber, and by reason of the air thus forced into the induction-chamber the valves will be forced over the opening, and thus prevent the escape of the water back into the well. From the internal chambers the water is forced by the pump down through the passages and into the suction-chamber at the bottom of the cylinder, and it passes up through the opening 7 in the false bottom 8, where it is scooped by the triple-bladed screw, and by the peculiar formation of the same thrown by centrifugal force through the eduction-ports at the sides of the cylinder and into the eduction-chambers, and from thence to the eduction-pipes, and finally into the discharge-pipe which is common to both eduction-pipes. The operation of the opposite duplicate portion of the pump is exactly the same as just described, only as one set of mechanism is inducing water the opposite set is expelling the same, so that a constant supply of water is passing into the suction-chamber and expelled by the wheel into the eduction chambers and pipes leading therefrom.

Under certain circumstances, as when using the pump in shallow wells, I propose to dispense with the air-compressing mechanism, as in such case its use is not essential to the working of the pump, but still use the air-pipes and leave the opening at the top of the pipes open.

Each of the eduction or discharge chambers 27 communicates with an adjacent induction-chambers through an opening or port 48, normally closed by an inwardly-opening valve 49. By this opening air pumped into the induction-chambers may pass into the eduction or discharge chambers, and thus the water forced through the discharge-pipes.

Certain novel features herein illustrated and described, but not claimed, form a part of the subject-matter of a companion application now pending, filed October 24, 1925, Serial No. 388,018.

Having described my invention, what I claim is—

1. In a compound pump, the combination with the pump-stock terminating at its lower end in a cylinder communicating with a suction-chamber, of a rotatable pump-rod mounted in the stock and having a screw at its lower end, induction-chambers located at each side

of the cylinder and communicating therewith, and having induction-ports and internal chambers mounted in the induction-chambers and communicating therewith and with the suction-chamber, and a pair of pumps, one of which is connected with each of the induction-chambers, and eduction-pipes connecting with the cylinder, substantially as specified.

2. In a compound pump, the combination, with the pump-stock terminating at its lower end in a cylinder communicating with a suction-chamber located at the lower end of the stock, of a rotatable pump-rod mounted in the stock and having a screw at its lower end, induction-chambers located at each side of the cylinder and communicating therewith and having induction-ports and internal chambers mounted in the induction-chambers and communicating therewith and with the suction-chamber, a pair of pumps connected with each of the induction-chambers, and eduction-chambers communicating with ports formed in the cylinder, and a pipe leading from each of said chambers and communicating with a common discharge-pipe, substantially as specified.

3. The combination, with the pump-stock and enlarged cylinder having discharge-ports, induction-chambers communicating with the cylinder through the ports and arranged without and at the side of the cylinder and pipes leading therefrom, and a false bottom having an opening communicating with the cylinder and in connection with the true bottom, forming a suction-chamber, of water-supplying device for delivering water to the suction-chamber, a rotatable pump-rod and a water-screw, and means for operating the same, said screw being so constructed as to take up and deliver the water through the eduction-ports in said chambers, substantially as specified.

4. In a compound pump, the combination, with a pump-cylinder and means for delivering water therefrom, of an induction-chamber provided with an opening and an inwardly-opening valve, and provided with an opening in its bottom, over which is mounted an internal chamber provided with an opening, an inwardly-opening valve, and an air-pump communicating with the induction-chamber, and means of communication between the internal chamber and the pump-cylinder, substantially as specified.

5. In a pump, the combination, with an induction-cylinder, an air-pipe leading therefrom, and a pump connected to the same and adapted to force air thereinto, of an air-chamber located below the pump and communicating with the pipe and having an opening covered by a clap-valve having an outwardly-protruding lug, and of a wheel, a shaft for the same, and means for rotating the wheel, which wheel is provided with a flange or cam for a portion of its circumference adapted for contact with the lug of the

cut-off, and a consequent opening of the latter, substantially as described.

6. In a pump, the combination, with an induction-cylinder, of an air-pump, a pipe connecting the pump with the cylinder, and an air-escape located between the pump and chamber, a valve covering the escape, and a cam-wheel for opening the valve at each upstroke of the piston, substantially as specified.

7. The combination, with the pump-cylinder, the stock, the induction-chambers located at each side of the same and communicating with the stock, and provided with valve-openings and exit-ports leading from the cylinder, of air-pumps located at each side of the pump-stock, air-pipes leading from the pumps to the chambers, pistons mounted in the pumps, a transverse shaft having oppositely disposed cranks connected with the pistons, and means for operating the shaft, substantially as specified.

8. The combination, with the pump-cylinder having discharge-ports, induction-chambers communicating with the ports, and the lower induction-chamber having an opening at its center, of the pump-rod and means for rotating the same, and the triple-bladed screw, as described, and adapted to take up water and throw the same to the eduction-ports, substantially as specified.

9. The combination, with the pump-stock terminating in a cylinder, a screw mounted on a rod within the cylinder, and induction-chambers located at the sides of the cylinder and communicating therewith, a pinion located upon the end of the pump-rod, and opposite air-pumps, each communicating with an induction-chamber and provided with reciprocating pistons, of a shaft extending across the stock and having oppositely-disposed cranks, each connecting with a pump-piston, and a central gear meshing with the pinion, substantially as specified.

10. The combination, with the pump-cylinder, opposite induction-chambers communicating therewith, opposite pumps having pistons, pipes leading from the pumps to the chambers, and air-chambers communicating with the pipe below the pumps and having inwardly-opening valves provided with outwardly-projecting studs, of a transverse shaft oppositely cranked, and each crank connected with a piston, so that the pumps are oppositely operated, and opposite wheels mounted on the shaft, having the opposite halves of their inner faces provided with cams or flanges adapted to come in contact with and operate the valves with the air-chambers, the flange of each wheel occurring opposite the disposition of the adjacent crank-portion of the shaft, so that the air-chambers are opened upon the upstroke of the piston of the pump communicating therewith, and means for rotating said shaft, substantially as specified.

11. The combination, with the pump-cylinder having discharge-ports, of induction-chambers communicating with the cylinder,

pumps connected with the induction-chambers and the latter communicating with the pump-cylinder, a revolving screw mounted in the cylinder, and discharge-chambers mounted over the ports of the cylinder and communicating with the induction-chambers through valve-openings, substantially as specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

CHARLES W. CRANNELL

Witnesses:

F. W. CASTERLINE,

E. G. SIGGERS.

**Defendants' Exhibit "H."**

[Endorsed]: No. 485—Eq. Defts. Exhibit "H."  
Filed September 3, 1920. W. B. Maling, Clerk. By  
J. A. Schaertzer, Deputy Clerk.

No. 3627. United States Circuit Court of Appeals  
for the Ninth Circuit. Filed Jan. 6, 1921. F. D.  
Monckton, Clerk.

No. 633,474.

R. J. NORTHAM.  
ROTARY PUMP.

Patented Sept. 19, 1899.

Application filed July 29, 1898.

(No Model.)

2 Sheets—Sheet 1.

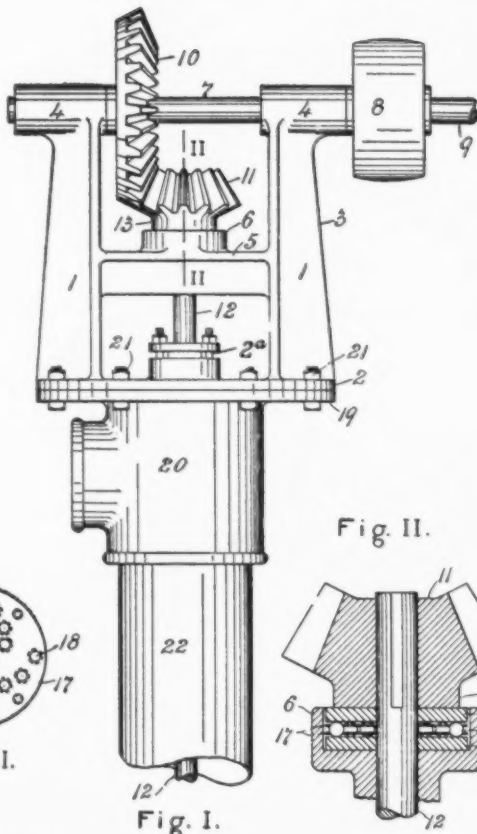


Fig. II.

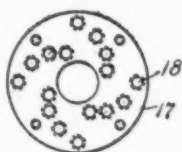
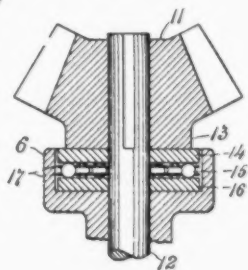


Fig. III.

Fig. I.

Witnesses  
*Henry E. Brett*  
*Roy Allen*

Inventor  
*R. J. Northam*  
BY *Knights Rm.*  
ATTORNEYS





## UNITED STATES PATENT OFFICE.

ROBERT J. NORTHAM, OF LOS ANGELES, CALIFORNIA.

## ROTARY PUMP.

SPECIFICATION forming part of Letters Patent No. 633,474, Dated September 19, 1899.

Application filed July 25, 1898. Serial No. 686,867. (No model.)

*To all whom it may concern:*

Be it known that I, ROBERT J. NORTHAM, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented certain new and useful Improvements in Rotary Pumps, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to improvements in rotary pumps, more especially the means of driving the pump-shaft, the screw-blades for raising the water, and the guides for regulating and bracing the pump-shaft, also the peculiar construction of shaft adapted to a well in which the casing may be bent; and my invention consists in features of novelty hereinafter described and claimed.

Figure I is a front elevation of my improved pump-head, showing a fragment of the casing connected therewith. Fig. II is a vertical section taken on line II II, Fig. I. Fig. III is a top view of one of the spacing-plates for the ball-bearings. Fig. IV is a vertical section of a well-casing, showing my improved screw-blades on the pump-shaft and the guides for holding the screw-blades from contact with the inner side of the well-casing, the screw-blades and guides being shown in elevation and also in section. Fig. V is a vertical section of a well-casing, showing a modified form of screw-blades, the spacing-guides, and a modified form of pump-shaft, the screw-blades and guides being shown in side elevation and vertical section, the vertical section of the guide being taken on line V V, Fig. VI. Fig. VI is a plan view of my improved guide. Fig. VII is a vertical section of the screw-blade taken on line VII VII, Fig. IV.

Referring to the drawings, 1 represents my improved pump-head, consisting of a base-plate 2 and vertical posts 3, having journal-bearings 4 located at their upper ends and having a cross-frame 5, with a hub 6.

7 represents an operating-shaft extending in a horizontal direction, to which is secured a driving-pulley 8. The shaft 7 may be extended, as shown at 9, in order that more than one pump may be operated by the same shaft. The shaft 7 is journaled in the bearings 4 and is provided with a beveled gear-wheel 10, the

beveled gear-wheel 11 on the upper end of the pump-shaft 12. On the lower end of the gear-wheel 11 is a collar 13, resting upon a bearing-plate 14, the bearing-plate 14 resting on ball-bearings 15, which in turn rest upon a plate 16. The ball-bearings are spaced apart by means of upper and lower spacing-plates 17, said spacing-plates being provided with a series of circular apertures 18 of less diameter than the ball-bearings and through which the balls partially extend, said balls being thus held a proper distance from each other. The bearing plates 14 16, the ball-bearings, and the spacing-plates are all inclosed by the hub 6 on the cross-frame 5.

2a represents a packing-gland supported by the plate 2, said plate 2 resting upon a plate 19, which is an integral part of a T-coupling 20.

21 represents bolts for securing the plates 2 and 19 to each other.

22 represents a well-casing, to which the T-coupling 20 is secured.

23 represents my improved screw-blades for raising water or other liquid. The blades 23 have a central hub 24, said hub being threaded on its inner side and forming a coupling for the meeting sections of the pump-shaft 12, which screw into said hub. The hub 24 is elongated, as shown at 25, on the under side of the screw-blades, said hub spacing the guides the proper distance from the screw-blades. There may be any number of convolutions of the screw-blade. I have shown two convolutions in my drawings.

26 represents a peripheral shell on the outer ends of the screw-blades, the result being that the passage-way of the water as it passes through the blades is entirely inclosed, thus preventing the water from passing downward over the outer edges of the blades when the pump is in operation.

The provision of the peripheral shell 26 has another advantage in forming a broad surface contiguous to the casing 22 and which prevents the outer edges of the blades 23 from cutting into the casing 22 when the guides become worn or displaced.

27 represents the passage-way through which the water travels as the pump is rotated. In order that the screw-blades may not come in contact with the sides of the well-casing, I

provide a guide 28, loosely mounted upon the shaft 12 and supported by a set collar 29. 30 represents a hub in said guides having a central passage 31, through which the pumping-shaft extends, having radiating spokes or arms 32 and a peripheral ring 33, connecting the ends of the spokes. At the end of each spoke 32 are vertically-extending brackets 34, said brackets being provided on their outer face with vertical slots 35.

36 represents flat springs which are seated in the slots 35 and have their upper ends connected to the brackets 34 by means of rivets 37, said springs pressing outwardly against the inner sides of the well-casing and holding the pump-shaft at the center of the casing. The brackets 34 extend outwardly beyond the outer line of the screw-blades, so that even were the springs entirely compressed within the recesses in the brackets still the periphery of the screw-blades would not come in contact with the sides of the casing.

In Fig. V, I have shown a modification of my screw-blades in which there is only one convolution or two sections forming one convolution, said blades being provided with vertical flanges 38, which retain or prevent the water from passing down between the outer edges of the blades and the well-casing. In

Fig. V, I have also shown a modification of the pump-operating shaft 12, the sections being coupled together by universal joints consisting of knuckles 39, 40, secured to each other by pins 41, 42. The knuckles 40 are connected with a short section of threaded pipe 43, which screws into the hub 25 of the screw-blades, the jointed pump-shaft being adapted for well-casings that have become bent in driving, thus dispensing with the

usual practice of placing a smaller straight casing within a larger crooked casing.

I claim as my invention—

1. A rotary pump comprising a casing, a rotary shaft consisting of sections having screw-threaded ends, the screw-blade having an internally-screw-threaded hub, within which the adjacent screw-threaded ends of the shaft-sections engage, and a peripheral shell contiguous to the casing, the guide having a hub, radial spokes, a peripheral ring and vertical brackets, extending upwardly and downwardly from the ring, and a set collar, whereby the hub of the guide is secured against the hub of the screw-blade; substantially as described. 55

2. As a new article of manufacture, a guide for the shafts of rotary pumps consisting of a central hub through which the shaft passes, radiating spokes, brackets on the ends of said spokes, recesses in said brackets, and flat springs having one of their ends secured in said recesses, substantially as set forth. 60

3. A rotary pump comprising a casing, a rotary shaft consisting of sections having knuckles and screw-threaded ends, the screw-blade having an internally-screw-threaded hub, within which the adjacent screw-threaded ends of the shaft-sections engage, a peripheral shell contiguous to the casing, and a guide having a hub, radial spokes, a peripheral ring and vertical brackets, the hub of the guide being secured against the hub of the screw-blade by one of the knuckles, which acts as a collar; substantially as described. 75

ROBERT J. NORTHAM.

Witnesses:

FRANK S. LIVINGSTON,  
JAS. E. KNIGHT.

**Defendants' Exhibit "I."**

[Endorsed]: No. 485—Eq. Defts. Exhibit "I."  
Filed Sept. 3, 1920. W. B. Maling, Clerk. By J. A.  
Schaertzer, Deputy Clerk.

No. 3627. United States Circuit Court of Appeals  
for the Ninth Circuit. Filed Jan. 6, 1921. F. D.  
Monckton, Clerk.

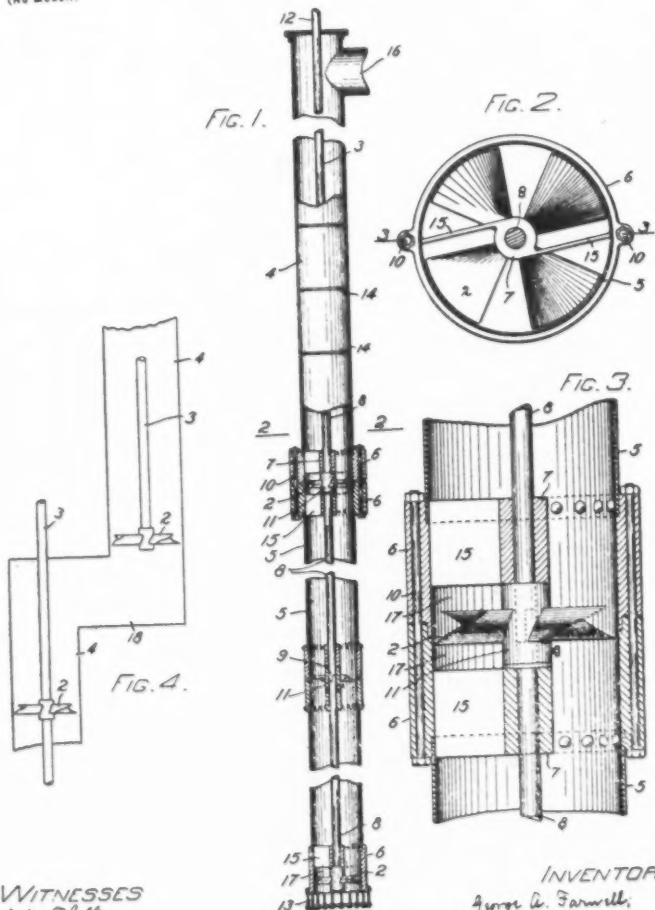
No. 691,123.

Patented Jan. 14, 1902.

G. A. FARWELL.  
PUMPING AND DREDGING APPARATUS.

(Application filed Mar. 9, 1901.)

(No Model.)



WITNESSES  
Edwin P. Collins  
Charles C. Reuter Jr

INVENTOR  
George A. Farwell,  
BY  
E. A. Blackman,  
ATTORNEY

## UNITED STATES PATENT OFFICE.

GEORGE A. FARWELL, OF MANCHESTER, NEW HAMPSHIRE.

## PUMPING AND DREDGING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 691,123, dated January 14, 1902.  
Application filed March 5, 1901. Serial No. 49,787. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE A. FARWELL, a citizen of the United States, residing at Manchester, in the county of Hillsboro and State of New Hampshire, have invented certain new and useful improvements in Pumping and Dredging Apparatus, of which the following is a specification.

My invention relates to apparatus such as is used for pumping out dry-docks, wrecks of vessels, and the like, and more particularly to apparatus of that type in which the water is forced upward by the action of one or more propeller-blades secured to a revolving shaft which is centrally journaled within a suitable pipe or passage-way, each propeller being arranged to act upon the water raised up to it and force it upward to the propeller next above it, thus effecting a step-by-step propulsion of the water through the apparatus.

My invention is intended to improve upon prior apparatus of the type above referred to as to certain features hereinafter set forth, and particularly to provide for the building up of an efficient apparatus out of any desired number of similar unit-sections, according to the height to which it is desired to raise the water operated upon, said unit-sections being superimposed and operated simultaneously.

In the accompanying drawings, Figure 1 is a side view, partly in elevation and partly in central vertical section, of a pumping apparatus constructed in accordance with my invention. Fig. 2 is a cross-section, enlarged, on the line 2 2 in Fig. 1. Fig. 3 is a vertical section of a portion of the apparatus, taken on the line 3 3 in Fig. 2. Fig. 4 is a diagrammatic view illustrating a modification of my apparatus.

The apparatus shown in the drawings is composed of a series of screw-propellers 2, secured to and operated by a common shaft or line of shafting 3, which is centrally journaled and supported within a vertical pipe 4. Said pipe and shafting are made up of superimposed similar sections, the number of which varies according to the height to which it is desired to force the water or other material operated upon and which can readily be separated or coupled together, as desired. The apparatus thus comprises a number of similar units, each of which consists, preferably,

of a length of pipe 5, provided at each end with a flange 6, to which it is bolted, and with a central hub or bearing 7, on which is journaled a length of shafting 8, having a propeller 2 secured thereto. In order to enable said unit lengths to be secured together conveniently and expeditiously, I prefer to form the ends of each section of shaft 8 with interlocking half ends, as shown at 9, so that the shaft will rotate as a whole when the units are assembled and fastened together, as by bolts 10, passed through the flanges 6, as shown. Each propeller 2 is secured to its length of shaft 8 at any desired point, but preferably at its upper end, in such manner that the thrust of the propeller is received by the bearing 7, on which it is supported, while the hub 11 of the propeller itself acts as a coupling to receive the interlocking end of the shaft length 8 next above it, as shown in Fig. 3. In the apparatus shown the lower section of shafting 8 has two propellers secured to it, one at each end; but all the sections above it except the top one have only one propeller each, and said top section has none, serving simply to drive the sections below it. Each section of shafting 8 may, however, have any desired number of propellers secured to it, according to its length, the propellers being usually located about eight feet apart. Power is applied to the top of the shaft, as at 12, by any suitable means, but preferably by a direct-connected engine or motor, (not shown,) and the device will ordinarily have a strainer 13 secured to its lower end. In Fig. 1 I have shown the exterior of the pipe 4 as provided with a series of horizontal rods or other projections 14, forming a ladder upon which the apparatus may be ascended and descended.

In order to prevent the column of water contained within the pipe 4 from being rotated bodily by the action of the propellers 2 and thereby diminishing or destroying the propelling effect of the latter, I provide a series of longitudinal ribs or riddle-boards 15, preferably radially arranged and cast integral with the flanges 6 and bearings 7, and thus serving to connect the latter with said flanges. As thus constructed one riddle-board 15 is located above and one below each propeller 2, as shown, so that any tendency of the column of liquid to rotate will immediately be checked

by said riffle-boards, and its flow will be directed upwardly through the pipe 4 and out through the opening 16, provided at or near its top. I prefer to arrange the riffle-boards 15 tangentially to the hub 7 respectively, as best shown in Fig. 2, so that each riffle-board will extend from the circumference of the apparatus to a point forward of its center with respect to the direction in which the shaft 8 rotates, the object of this construction being to present to the ascending column of water a series of surfaces slightly inclined in such manner that all circumferentially-flowing currents will be deflected by said surfaces toward the center of the apparatus where the centrifugal action is the least, so that the tendency of the water-column to rotate as a whole with the propellers will be neutralized and all the power applied will be utilized in lifting said column. I also prefer to provide spaces 17 between each propeller 2 and the adjacent riffle-boards 15 sufficiently wide to afford clearance for the largest solid substances which can pass through the strainer 13 in order to avoid injury to the propellers.

In Fig. 4 I have indicated an arrangement whereby my apparatus may be adapted to be used for raising water to considerable heights, as is often desirable in carrying on mining operations and the like. According to this arrangement the pipe system 4 is offset at suitable intervals, as at 18, and is independently supported at each offset. Each portion of said pipe 4 between two offsets is provided with a separate shaft 3, carrying any desired number of propellers 2, said shafts being driven simultaneously by any suitable means. As thus constructed each shaft and the propeller or propellers carried by it serve to lift the water from one offset portion 18 to the next, the head of water in any section of pipe 4 being thus prevented from exerting pressure upon the pipe and propellers below such section, while the total weight of the column of water and of the apparatus itself is divided and independently supported at a suitable number of points.

By employing the unit construction described my apparatus may be made very portable and can readily be set up at any desired place and made of any desired height, according to the circumstances in which it is to be used. For example, when used in pumping out wrecks it can be suspended by its top from the boom or mast-head of the wreck or of a lighter and raised or lowered bodily at will. It may also be used effectively for lifting water charged with grain, coal, or the like, as in emptying wrecks, as it has no valves or similar parts which might be clogged or obstructed by any solid substance contained in the water which is drawn through it, and it is thus well adapted for dredging on muddy, sandy, or gravelly bottoms. In such cases the strainer 13 will have a mesh corresponding to the coarsest solid material which is to pass through it, and the powerful currents

produced at and near said strainer by the suction due to the action of the propellers as they force the water up through the pipe will loosen the adjacent material by their erosive action and carry it in suspension into the apparatus and out through its open top.

It will be evident that my apparatus may be considerably modified in various details without departing from my invention and that it may be set up and operated at any desired angle instead of vertically.

I claim as my invention—

1. In an apparatus of the character described, the combination of a pipe, a shaft journaled therein, one or more propellers secured to said shaft, and one or more longitudinal riffle-boards secured within said pipe, each extending from the circumference thereof to a point forward of its center with respect to the direction of rotation of said shaft, for the purpose set forth.

2. In an apparatus of the character described, the combination of a series of pipe-sections secured together at their ends, a bearing located at each end of each pipe-section and united thereto by integral ribs forming riffle-boards, each riffle-board extending from the circumference of its pipe-section to a point forward of the center thereof, a sectional shaft journaled in said bearings, and a series of propellers secured to said shaft between the bearings located at the adjacent ends of each pair of pipe-sections and supported on said bearings, spaces being provided between said propellers and the adjacent riffle-boards, substantially as described.

3. In an apparatus of the character described, a pipe-section provided at each end with a flange, a bearing, and one or more radial riffle-boards, a shaft-section journaled in said bearings, and a propeller secured to the upper end of said shaft and supported on the adjacent bearing, the hub of said propeller forming a coupling adapted to receive the interlocking end of an adjacent section of shaft, substantially as described.

4. In an apparatus of the character described, the combination of a series of pipe-sections detachably secured together and provided respectively at each end with a flange and a central bearing secured thereto by radial ribs, forming riffle-boards, a corresponding series of shaft-sections journaled in said bearings and provided with detachably-interlocked ends, and a propeller secured to each shaft-section and supported on the upper bearing of the corresponding pipe-section, between the adjacent sets of riffle-boards, substantially as described.

In testimony whereof I have hereunto subscribed my name this 27th day of February, 1901.

GEORGE A. FARWELL.

Witnesses:

GEO. W. SHERMAN,  
E. D. CHADWICK.

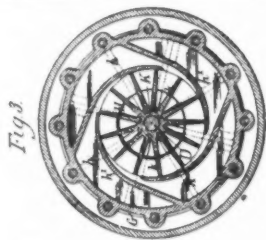
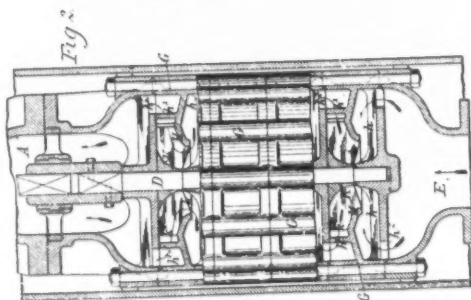
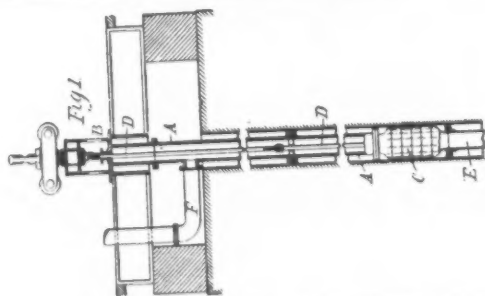
**Defendants' Exhibit "J."**

[Endorsed]: No. 485—Eq. Defts. Exhibit "J."  
Filed Sept. 3, 1920. W. B. Maling, Clerk. By J. A.  
Schaertzer, Deputy Clerk.

No. 3627. United States Circuit Court of Appeals  
for the Ninth Circuit. Filed Jan. 6, 1921. F. D.  
Monckton, Clerk.



(This Drawing is a reproduction of the Original and is reduced scale)



[Third Edition.]

No. 24,430

A. D. 1894

Date of Application, 15th Dec., 1894—Accepted, 19th Jan., 1895.

## COMPLETE SPECIFICATION.

## Apparatus for Pumping Well Bores.

I, WILLIAM MATHER, of Salford Iron Works, Manchester, in the County of Lancaster, Member of Parliament, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

- 5 My invention relates to apparatus for pumping water from well bores so arranged that the pump can be readily adjusted in position and power to suit greater or less depths of bore.

For this purpose I extend down the bore a pipe which is the delivery pipe of the pump and in this pipe there is a spindle which is driven at the top of the well by  
10 any suitable motor, and which works a rotary pump or special construction attached to the pipe.

Fig. 1 of the accompanying drawings is a vertical section of the bore, pipe, spindle and pump; the other figures shew to an enlarged scale the construction of the pump. Fig. 2 being a longitudinal section partly in elevation and Fig. 3 a  
15 transverse section shewing the revolving blades and the fixed spiral and radial guides, the radial guides being shewn by dotted lines.

Referring first to Fig. 1, A is the pipe which extends down the bore from a framing B at the top of the well and carries at its lower end the pump C. In the pipe, guided by suitable bearings revolves the spindle D which drives the blades of  
20 the pump.

Water drawn up the suction pipe E flows up the vertical pipe A and out by a lateral branch F.

The pump consists of a number of disc shaped segments G bolted together, and to the end segments of which are bolted respectively the suction pipe E and the  
25 discharge pipe A. In each of the segments G there is a partition H which does not reach to the centre but leaves an annular passage around the boss K of the wheel. On the suction side of the partition H as shewn in Fig. 2 are radial ribs h on the other side there are spiral guide ribs  $h^1$ , and through one side of the section there are holes  $h^2$  opening into the spaces between the radial ribs of the next  
30 section in order. In each section on the one side of the partition revolves a wheel consisting of a boss K keyed on the spindle D and a number of blades projecting from the boss. Each blade, a section of which is shewn in Fig. 4, has its part k which is next the boss projecting into the annular space within the partition H, the other part  $k^1$  revolves between the partition H and the face of the next section in  
35 order. Water, entering by the holes  $h^2$  in the lowest section, is by the parts k of the first set of blades caused to pass up beyond the first partition and driven by the parts  $k^1$  of the blades along between the spiral guides  $h^1$ , thence through the holes  $h^2$  into the next section where its rotating motion is first arrested by the radial ribs h, and then it is again acted on by the blades of a second wheel,  
40 thus receiving repeated impulses until it issues from the highest section into the pipe A with sufficient pressure to overcome the column above it.

When the level of water sinks in the bore, the pipe A is lengthened and the pump has sections and wheels added to it so as to give the water sufficient pressure to overcome the increased column.

[Price 6d.]

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*Mather's Apparatus for Pumping Well Bores.*

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Having now particularly described and ascertained the nature of this invention and in what manner the same is to be performed, I would have it understood that I do not make any general claim to the construction of the segments and wheels of the pump, as pumps operating in the manner described are already known, but what I claim is:—

Apparatus for pumping well bores consisting of a delivery pipe extending down the bore, carrying at its lower end a pump of the kind described, and having in it a spindle on which the wheels of the pump are keyed, substantially as described.

Dated this 15th day of December 1894.

ABEL & IMRAY,  
Agents for the Applicant.

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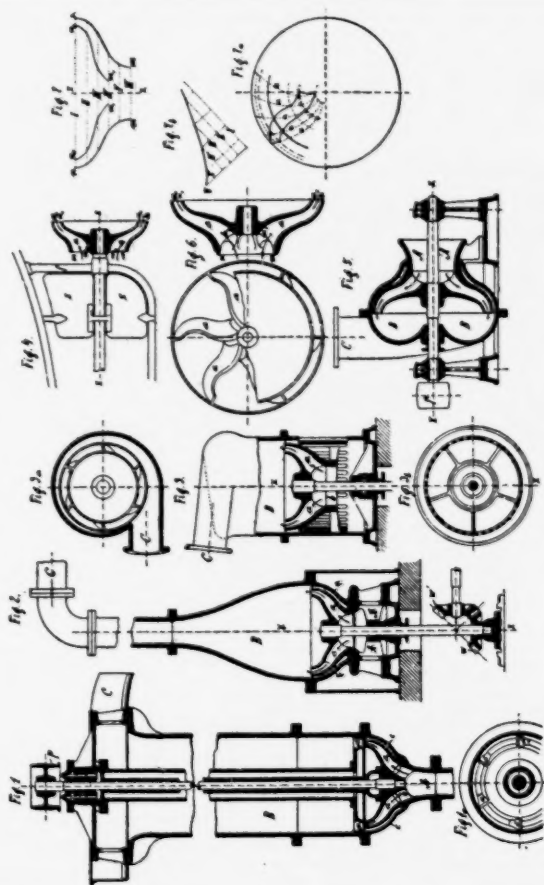
Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.

[Wt. 3—50/7/1915.]

**Defendants' Exhibit "K."**

[Endorsed]: No. 485—Eq. Defendants' Exhibit "K." Filed Sept. 3, 1920. W. B. Maling, Clerk. By J. A. Schaertzer, Deputy Clerk.

No. 3627. United States Circuit Court of Appeals for the Ninth Circuit. Filed Jan. 6, 1921. F. D. Monekton, Clerk.



[This Drawing is a reproduction of the Original on a reduced scale]

[Third Edition.]

A. D. 1885, 27th October. No. 12,886.

## PROVISIONAL SPECIFICATION.

## Improvements in Propellor-wheels for Pumps, Ventilators, and Propellers in Water and Air.

I, LADISLAV VOJACEK, of Smichov Prague, Bohemia, in the Empire of Austria, Engineer, do hereby declare the nature of this invention to be as follows:—

The object of my Invention is the construction of a propeller by which any fluid, water or air is caused to rotate energetically in screw thread streams after it has left the wheel, the blades and sides of which are so formed, that the double inclination acts in combination with the centrifugal force.

My wheel is composed of a number of equal and equally distant blades, enclosed between two concentrical casings, so as to form helical conduits of a sinusoidal shape. If the fluid could flow only in planes laid through the axis, it would enter the inlet near the axis and parallel to the same, then it would proceed with continually increasing inclination till a certain limit were reached, after which the inclination would gradually diminish till at the outlet it would be nil.

The blades are helical, their surfaces being formed through a combined movement of a curve. This is a plane curve; it is drawn in a plane which is perpendicular to the axis of rotation. This plane is supposed to move in the direction of the axis, and at the same time to rotate around it, both movements standing in a geometrical connection to each other.

I form this surface with a horizontal plate pattern which contains the generatrix which turns on a vertical spindle with pin, allowing free motion in the direction of the axis of rotation. The generatrix pattern slides at the same time on a screw thread pattern fixed to the same horizontal plate or board with the spindle.

By the combination of these patterns with the rotating patterns for the concentrical casements—these patterns being of the said sinusoidal shape—it is easy to produce the exact form for casting the blades.

In other cases the blades are cast of the required shape or they are shaped by pressure or by hammering. If the blades have the correct form, corresponding to the velocity, the fluid or air enters without shock in the centre of the wheel.

Owing to the form of the blades and casings in my propeller, the centrifugal force produced by the rotation of the wheels is utilised.

The propeller wheel throws out the streams of liquid in such a way that they form a hollow cylinder round the axis of rotation, though their direction is not

[Price 2s.]

[Price 6d.]

*Vojacek's Improvements in Propeller-wheels for Pumps, &c.*

parallel to that axis. Their inclination to the axis depends on the shape of the wheel and blades; on the velocity of rotation and on the difference of pressures. In the case of a pump or a ventilator the streams of liquid or of an escape into a concentric tube or casement. If the diameter of this tube remains constant i. e. nearly the same as the largest diameter of the wheel, the pitch of the thread will 5 remain nearly constant. The pitch will increase if the diameter decreases and vice-versa.

If a considerable height of delivery is required, the vertical cylinder casement is shaped so as to diminish gradually to the diameter of a vertical tube or pipe, mounted in the axis and upon the said casement. By this arrangement the pitch 10 of the thread in which the water rises from the wheel will steadily increase, till on its arrival and entry into the pipe, it will be so steep that practically it will flow straightway through the pipe which may then have any desired direction.

The screw thread motion of the issuing liquid has not heretofore been utilised.

It is to be understood that my propeller wheel will act as a reaction propeller 15 whether in water or in air.

In some cases either the internal or the external casement of the propeller may be dispensed with so that the blades will be open either outwardly or inwardly.

In other cases again the outward casement need not cover the whole line of the blades, a hoop or band only being left to connect and hold the blades together. 20

Dated 27th October 1885.

GEO. DOWNING,  
Agent for Applicant.

## COMPLETE SPECIFICATION.

## Improvements in Propeller-wheels for Pumps, Ventilators, and Propellers in Water and Air.

I, LADISLAV VOJACEK, of Smichov Prague, Bohemia, in the Empire of Austria Engineer, do hereby declare the nature of my said invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

- 5 The object of my Invention is the construction of a new description of propeller by which water, air, or any other fluid, may be caused to rotate energetically in helical streams, after leaving the wheel or propeller, the blades and sides of which are so formed, that the two fold result acts in combination with the centrifugal force.
- 10 My improved propeller which is composed of a number of equal and equi-distant blades, enclosed between two concentric casings, so as to form helical conduits of a sinusoidal or sinuous form. If the fluid could flow only in planes laid through the axis, it would enter the inlet near the axis, and travel parallel to the same; then it would proceed, with continually increasing inclination until a certain limit were
- 15 reached, after which this inclination would gradually diminish until at the outlet it would be nil.

- The blades are helical, their surfaces being formed through a compound delineation of a curve. This is a plane curve; and is drawn in a plane which lies perpendicular to the axis of rotation. This plane is supposed to move in the
- 20 direction of the axis, and at the same time to rotate around it, both movements standing in a geometrical relation to each other.

- I form this surface with a horizontal template cut to the curve necessary for obtaining the required form, and which template is revolved on a vertical spindle with a pin, allowing free motion in the direction of the axis of rotation. The
- 25 generating pattern or template slides at the same time on a screw thread fixed to the same horizontal plate or board with the spindle. By the combination of these patterns or templates with the rotating patterns or templates for the concentric casing—the patterns being of the said sinusoidal form, the exact forms for casting the blades are obtained.

- 30 In other cases the blades are cast of the required shape or they are shaped by pressure or by hammering. If the blades have the correct form, corresponding to the velocity, the fluid or air enters without shock in the centre at the wheel.

Owing to the form of the blades and casing in my propeller, the centrifugal force produced by the rotation of the wheels is utilised.

- 35 The propeller wheel throws the streams of liquid outwards in such a manner that they form a hollow cylinder round the axis of rotation, through their direction may not be parallel to that axis. Their inclination to the axis depends on the form of the wheel and blades; on the velocity of rotation; and on the difference of the pressures.

- 40 In the case of a pump or a ventilator, the streams of liquid or of air escape into a concentric tube or casing. If the diameter of this tube remains constant that is to say, nearly the same as the largest diameter of the wheel, the pitch of the helice will remain nearly constant. The pitch will increase if the diameter decreases, and vice-versa.



*Vojacek's Improvements in Propeller-wheels for Pumps, &c.*

If a considerable height of delivery is required, the vertical uptake or pipe is so formed as to diminish gradually in diameter, thus forming a vertical tube or pipe, mounted concentrically above the casing. By this arrangement the pitch of the helix in which the fluid rises from the wheel, will steadily increase until, on its arrival and entry into the pipe, it will be so great that, practically, it will flow straight through the pipe, which may thus have any desired direction.

This helical motion of the issuing fluid has not heretofore been utilised.

It is to be understood that my propeller wheel will act as a reaction propeller, whether for water or air.

In some cases either the internal or the external casing of the propeller may be dispensed with so that the blades will be open either outwardly or inwardly. In other cases again the outward casing need not cover the whole line of the blades, a hoop or band only being left to connect and hold the blades together.

And in order that my said invention may be more particularly described and ascertained, reference is hereby made to the accompanying drawings, in which 15 similar letters of reference indicate corresponding parts.

Fig. 1. Is a sectional elevation of a propeller-wheel-pump, with vertical axis, suitable for small heights of delivery.

Fig. 1<sup>a</sup> is a horizontal section of the same shewing the directing blades  $a1$ .

Fig. 2 is a sectional elevation of a propeller-wheel-pump for considerable heights 20 of delivery.

Fig. 3 is an elevation, partly in section of a propeller-wheel-pump with vertical axis and low pitch.

Fig. 3<sup>a</sup> is a horizontal view of the propeller wheel, shewn in Fig. 3.

Fig. 4 shews the application of my propeller-wheel to a boat.

25

Fig. 5 is a sectional elevation of a propeller-wheel for a ventilator.

Fig. 6 is a front view and section of a propeller-wheel shewing the shape of the blades and case; and Figs. 7, 7<sup>a</sup> & 7<sup>b</sup> show the geometrical construction for practically obtaining the exact forms of blades and casing of the propeller.

My propeller wheel is composed of equal and equi-distant blades  $a$  enclosed in 30 two concentric curved discs  $m$   $m1$ ,  $n$   $n1$ , forming the casing so as to furnish helical passages of a special form. This form is shewn in Fig. 7;  $x$   $x$  being the axis of rotation,  $m$   $m1$  the inlet ports, and  $n$   $n1$  the outlet. The inclination of the curve to the axis is made very small, in the inlet as well as in the outlet, and it gradually increases towards the middle between the two ends.

35

The blades  $a$  are formed by a horizontal generating template  $u$  shown in Fig. 7<sup>a</sup>. This template is turning round its axis, slides at the same time on a screw thread (Fig. 7<sup>b</sup>) which is cut out from a cylindrical plate, each point of which is at an equal distance from the axis of rotation.

The forms of the propeller wheel, shown in Fig. 6 and other figures, ensue 40 through the combined action of the before mentioned templates, with the rotating patterns or templates for the concentric casing. It is therefore easy to construct the geometrical forms for castings, or to cast matrices for pressing or hammering.

In other cases matrices or templates of wood or other suitable material may be prepared by turning bodies of the form  $m$   $n$   $n1$   $m1$ , in Fig. 7, with circles I, II, 45 III etc. It is easy to draw meridians on the surface of such bodies and to construct the outward lines of the blade as shewn in Fig. 7<sup>a</sup>. After this the facing of the blade can be cut to the exact form.

The forms of the patterns are dependent on each other, and calculated in such a way that the body of the fluid which by the rotation of the wheel, is caused to 50 pass through the same, does not exercise any pressure on the casing. Each particle of this fluid in passing through the wheel, is supposed to describe a line which lies completely in a rotating surface of the form  $m$   $n$ ,  $m1$   $n1$  or between the same.

The fluid enters the wheel without shock, and it leaves it with a certain 55 inclination, which depends on the velocity of the wheel; on the pressure; and on

Complete  
Specification

A. D. 1885.—No. 12,886.

*Vojacek's Improvements in Propeller-wheels for Pumps, &c.*

the shape of the blades. The inclination can therefore practically be varied, from about five to about sixty degrees.

If machines of the kind known as centrifugal pumps, or ventilators, are required, the blades are arranged so that the inclination will be small. In such cases, the liquid will flow out in a spiral curve or helice, which is nearly perpendicular to the axis of rotation. Otherwise if the inclination of the spirally ascending body is considerable, say exceeding 30 degrees, for instance, it is preferable to replace the outlet tube by a cylinder B, in the manner shown in Figs. 1 & 2. The particles of fluid will ascend in such a manner, as to form a hollow cylinder, concentrically to the axis of rotation, and each particle of fluid is caused to ascend spirally, thus exercising great pressure in the direction of the axis of rotation.

In some cases fixed distributing blades  $a^1 a^1$  are used as shown in Fig. 1. The whole arrangement resembles a turbine, the fixed blades of which are placed behind the wheel instead of before it.

Fig. 2 shows an arrangement for effecting a considerable height of delivery. The vertical case B is shaped so as to diminish gradually into a vertical tube or pipe, which is mounted above the case. The pitch of the helice, with which the particles of fluid ascend, will steadily increase, and after its arrival into the pipe, it will be so vertical that practically it will flow straight through the pipe, which will then conduct the flow upwards.

The helical motion is also produced in those forms of my machines, which act similarly to the ordinary centrifugal pumps, ventilators or exhaustors; and of which two examples are shown in Figs. 3 and 5. The effect of this arrangement will be the production of the helical motion of the fluid in the tube C, which is the chief feature of my invention. By this arrangement the head of liquid is increased, in the like proportion as the weight lifted on an inclined plane increases, in proportion to the weight which would be lifted by the same power in a vertical direction. This is especially the case in turbine-like arrangements which are represented in Fig. 1. The helical motion in the tube C (Figs. 2, 3 and 5) has, besides this, an effect similar to the rotary motion of projectiles from rifled guns, or the vortex motion of a cyclone in proportion to that of an ordinary storm. By this arrangement, liquids can pass through the tubes with a velocity of 3 to 5 meters a second, while in the ordinary way hardly the half of that speed can practically be reached.

Fig. 4 shows my wheel attached to a boat as a propeller, which will be understood without further explanation. It can also be used either in water or in air. The dimensions and the details differ. The centrifugal force, which in ordinary propellers is injurious, will thus be used up, and will cause a considerable increase of the effect. The particles of liquid or air will not disturb each other on their way, and the whole will act as a complete propeller, which is very well protected by the outer case, and strengthened by the inner one.

It is obvious that some portion of the case may be dispensed with in some of the applications of my invention.

In using my propeller wheel for pumps or ventilators, I arrange it so that the liquid or air under pressure shall not be allowed to escape on the outward surface of the propeller. This object is secured by providing the inlet with a metallic collar, to fit the case; and is lubricated, if necessary, so as to produce the least friction possible. These collars may also be adjustable for diminishing the wear and tear.

*Vojacek's Improvements in Propeller-wheels for Pumps, &c.*

50 Having now particularly described and ascertained the nature of my said  
Invention and in what manner the same is to be performed I declare that  
what I claim is:—

1. The manufacture and use of propeller wheels, with two concentric plates  
forming a casing of the form shewn with specially shaped blades, substantially as  
55 hereinbefore described and shown on the drawings.

2. The method and means of obtaining the exact geometrical forms of the blades,  
substantially as hereinbefore described and shewn on the drawings.

3. The method of and means and appliances for producing in pumps, ventilators  
and exhausters, the helical motion of liquid or air, and of utilising such motion for  
the transmission of the fluid, either in the direction of the axis of rotation or in 5  
any other direction, substantially as hereinbefore described and shown on the  
drawings.

4. In connection with pumps, ventilators or exhausters, as aforesaid the use of  
the collar fittings to the propeller, with its fixed casing, to prevent the liquid or air,  
under pressure, from escaping on the outward surface of the propeller, substantially 10  
as hereinbefore described and shewn on the drawings.

5. The application of my said wheels as propellers of boats or ships in water or  
air, substantially as hereinbefore described and shown in the drawings.

Dated 27th July, 1886.

GEO. DOWNING, 15  
Agent for Applicant.

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.  
[Wt. 15—50/7/1913.]

**Defendants' Exhibit "L."**

[Endorsed]: No. 485—Eq. Defts. Exhibit "L."  
Filed Sept. 3, 1920. W. B. Maling, Clerk. By J. A.  
Schaertzer, Deputy Clerk.

No. 3627. United States Circuit Court of Appeals  
for the Ninth Circuit. Filed Jan. 6, 1921. F. D.  
Monckton, Clerk.

AM. NOV. 13. N<sup>o</sup> 3774.  
MOON'S SPECIFICATION  
(3<sup>rd</sup> Edition)

(2 SHEETS)

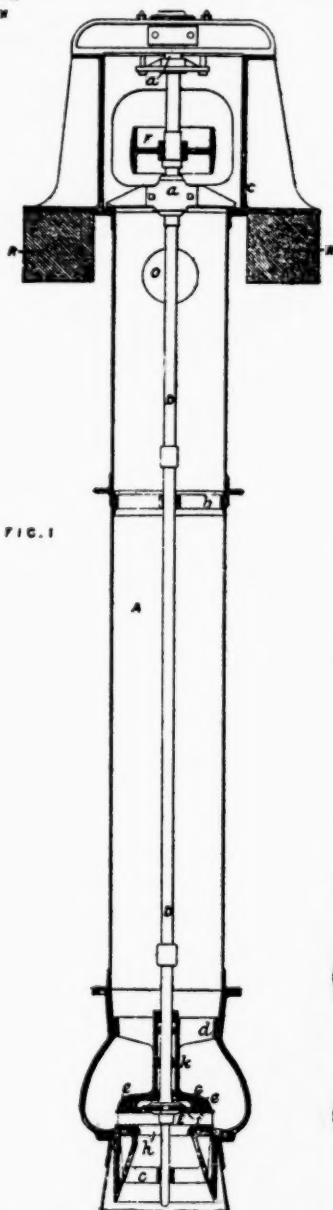


FIG. 1



FIG. 2.

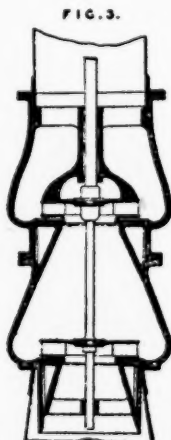


FIG. 3.

[Third Edition.]

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A. D. 1860, 13th November. No. 2774.

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ROTATORY PUMPS.

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LETTERS PATENT to David Thomson, of Grosvenor Road, Pimlico, for the Invention of "Certain Improvements in Rotatory Pumps for Raising Water and Other Liquids."

Sealed the 10th May 1861, and dated the 13th November 1860.

---

PROVISIONAL SPECIFICATION left by the said David Thomson at the Office of the Commissioners of Patents, with his Petition, on the 13th November 1860.

I, DAVID THOMSON, of Grosvenor Road, Pimlico, do hereby declare the nature of the said Invention for "Certain Improvements in Rotatory Pumps for Raising Water and other Liquids," to be as follows:—

Firstly, in causing the liquid that is being pumped to support the weight of the vertical driving shaft, or such portion of it as may be desired, or in certain cases to relieve one side of the revolving wheel of pressure, so that it may be entirely in equilibrium, which is accomplished by forming a communication between a portion or the whole of the top side of the revolving wheel, and the bottom or suction side at which the water is drawn in. The liquid in the rising main pipe being prevented from returning into the revolving wheel by a fixed plate placed immediately over it, and fitting close to the upper surface of the revolving wheel at one part. Secondly, in fixing the aforesaid plate and the requisite guides for the vertical shaft, seats are provided for them in the pipe in such a manner that the whole of the working parts can conveniently be removed and replaced without disturbing the body of the pump, whilst the said pump is immersed in the liquid.

This second part of my Invention is applicable to rotatory pumps, which draw the liquid from both sides of the revolving wheel.

[Price 8d.]

[Price 6d]

Thomson's Improvements in Rotatory Pumps.

SPECIFICATION in pursuance of the conditions of the Letters Patent, filed by the said David Thomson in the Great Seal Patent Office on the 11th May 1861.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, DAVID THOMSON, of Grosvenor Road, Pimlico, send greeting. 5

WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Thirteenth day of November, in the year of our Lord One thousand eight hundred and sixty, in the twenty-fourth year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said David Thomson, Her special licence that I, the said David 10 Thomson, my executors, administrators, and assigns, or such others as I, the said David Thomson, my executors, administrators, and assigns, should at any time agree with, and no others, from time to time and at all times thereafter during the term therein expressed, should and lawfully might make, use, exercise, and vend, within the United Kingdom of Great Britain and 15 Ireland, the Channel Islands, and Isle of Man, an Invention for "Certain Improvements in Rotatory Pumps for Raising Water and other Liquids," upon the condition (amongst others) that I, the said David Thomson, my executors or administrators, by an instrument in writing under my, or their, or one of their hands and seals, should particularly describe and ascertain 20 the nature of the said Invention, and in what manner the same was to be performed, and cause the same to be filed in the Great Seal Patent Office within six calendar months next and immediately after the date of the said Letters Patent.

NOW KNOW YE, that I, the said David Thomson, do hereby declare 25 the nature of the said Invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement thereof, that is to say:—

My improvements are applicable to rotatory pumps acting on the centrifugal principle, and their object is to remove a difficulty hitherto experienced in the 30 use of such pumps, namely, that if the pump is placed above the liquid to be pumped a valve is required in the suction pipe to enable the pump to be charged before it can commence work. The valve, especially when pumping muddy or impure water, is continually liable to derangement, and being under water is very difficult of access, and thereby causes a great objection to the use 35 of this form of pump. To obviate these objections, I have often made these pumps with the revolving spindle vertical, and the pump itself placed under water, thereby obviating the necessity of using any valve whatever, and this form of pump I have found to act well, but it is liable to this disadvantage, that before

## Thomson's Improvements in Rotatory Pumps.

it can be fixed the liquid in the well or reservoir must be lowered to a point below the level where the pump is intended to be fixed, and it must in like manner be lowered to this level whenever access is required to the pump for examination or repair. In all cases thus lowering the level of the water is  
 5 attended with inconvenience and expense, and my present Invention consists in so altering the arrangement and construction of the pump as to enable me to fix and work the pump under water, and thereby obviate the necessity of using any valve whatever, while at the same time I am enabled to fix or remove the whole pump or the working parts separately, whilst the liquid in  
 10 the well or reservoir remains at its ordinary level, entirely covering the working parts of the pump. This is effected by fixing the requisite guides for the vertical shaft or spindle in seats provided for them in the rising main pipe, in such a manner that they, and also the whole of the working parts, can be conveniently removed and replaced without disturbing the body of the pump, and  
 15 whilst the said pump is immersed in the liquid.

Another part of my Invention consists in causing the liquid that is being pumped to support the weight of the vertical driving shaft, or spindle, or such a portion of it as may be desired, or in certain cases to relieve one side of the revolving wheel of pressure, so that it may be entirely in equilibrium, which is  
 20 accomplished by forming a communication between a portion or the whole of the top side of the revolving wheel and the bottom or suction side of the same at which the water is drawn in, the liquid in the rising main pipe being prevented from returning into the revolving wheel by a fixed plate placed immediately over it and fitting close to the upper surface of the revolving  
 25 wheel at one part.

But in order that my invention may be more easily understood and readily carried into effect, I will now describe the best means I am acquainted with of performing the same, reference being had to the accompanying Drawing.

Figure 1 represents a vertical section of my improved pump; Figure 2  
 30 represents an inverted sectional plan of the revolving wheel. A is the rising main pipe, to the bottom of which is attached the pump chamber B; at the top the rising main pipe is fixed to the framing C, provided with the bearings *a*, *a*<sup>1</sup>, in which the vertical pump spindle D works. This passes down the centre of the rising main pipe A into the pump chamber B, where it is  
 35 attached to the rotatory fan E, while at the top it is provided with the drum F, through which the fan receives its rotatory motion. The guides *b*, *d*, and *c* are fitted into conical seats provided for them in the rising main pipe and at the bottom of the pump chamber.

The rotatory fan E is fixed on the spindle D, as shown. An inverted see-



Thomson's Improvements in Rotatory Pumps.

tional plan of this fan or wheel is shewn at Figure 2 with the arms as usually made; but I do not confine myself to any particular form of the arms. The revolution of this fan or wheel in the direction of the arrow when covered with liquid expels the same round the circumference of the wheel, causing it to ascend in the rising main pipe, whilst it draws in fresh liquid at the centre 5 opening *h*. On the top of the revolving fan or wheel is formed a small projecting rim *e*, fitting closely to the plate *G*. This rim prevents the water from the rising main passing into the centre part of the top of the revolving fan except in such small quantities as can leak through between the plate *G* and the rim *e*, or down the pipe *k*, through which the spindle passes. To provide 10 for the escape of such water as may leak through the small holes *f*, *f*, are made in the top plate of the revolving wheel, and through these the leakage passes into the body of the revolving wheel, and thence passes into the rising main. The water raised through the rising main is discharged through the opening *O*, placed at any convenient part of it.

In fixing this pump it is necessary that the revolving wheel should be under 15 the level of the liquid to be pumped, and the pump being entirely fixed to the girders or other framing *R*, *R*, at the top; it can be so fixed or removed at whatever height below that point the liquid may stand. The guides *b*, *d*, and *c*, which rest on conical seats are made so that each guide will pass through the 20 conical seats above it, by which means the whole may be drawn out or replaced from the top, whilst the seats themselves are under water.

The pump as now described even without the holes *f*, *f*, and plate *G* attached to the guide *d* would discharge the water and effect the main object of my In- 25 vention, but in that case the whole upper surface of the revolving wheel being exposed to the pressure of the liquid in the rising main pipe, whilst a portion of the lower surface equal to the area of the central opening *h* is exposed to a less pressure or partial vacuum; this excess of pressure on the upper side of the fan or revolving wheel would cause a great additional friction on the upper bearing *a* which carries the weight of the revolving parts. By the addition of 30 the holes *f*, *f*, and plate *G*, and the rim *e*, as above described, the pressure of the liquid in the rising main is removed from that part of the upper surface of the revolving wheel which is contained within the rim *e*, and by making this rim of a larger diameter than the opening *h*, not only is the pressure of the liquid in the rising main removed from the bearing *a*, but a sufficient excess 35 of pressure is obtained on the lower side of the wheel to support or nearly support the weight of the revolving parts themselves. The friction in the upper bearing *a* is thus reduced to a minimum, which is of great importance when the speed is so great as is required for centrifugal pumps.

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Thomson's Improvements in Rotatory Pumps.

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Figure 3 in the accompanying Drawing shews one of my improved pumps with two revolving wheels placed in connection with each other, in such a way that the water discharged by the lower wheel passes into the suction part of the upper wheel; by this means I can raise water or other liquids to any  
5 height with the same speed of revolution of the wheel that would be required for half the height with one wheel; and, if necessary, three or more wheels may be placed in conjunction in a similar manner with the effect of still further reducing the necessary speed of rotation.

Having now described the nature of my Invention, and in what manner the  
10 same is to be performed, I wish it to be understood that I do not limit myself to the exact details as shewn on the accompanying Drawing, as these may be modified according to circumstances; but what I claim is,—

Firstly, the general arrangement of rotatory pumps as herein-before described, by which the before described objects of my Invention are effected.

15 Secondly, the arrangement as herein-before described, by which, in my improved rotatory pumps, the pressure of the water is removed from the bearings, and by which the weight of the revolving parts is also wholly or partially supported by the pressure of the column of water or other liquid in the rising main on the under side of the wheel.

20 Thirdly, the arrangement, as herein-before described, by which the revolving wheel and spindle, and the guides thereof, may be taken out or replaced without the necessity of taking the pump out of the liquid, and whilst the liquid covers the said working parts.

Fourthly, the employment of two or more of my before-mentioned improved  
25 rotatory pumps conjointly, placed one over the other, with the guides fixed in conical seats, so that they can be removed or replaced while under water, as above described.

In witness whereof, I, the said David Thomson, have hereunto set my  
30 hand and seal, this Eleventh day of May, in the year of our Lord One thousand eight hundred and sixty-one.

DAVID THOMSON. (L.S.)

**Defendants' Exhibit "M."**

[Endorsed]: No. 485—Eq. Defts. Exhibit "M."  
Filed Sept. 3, 1920. W. B. Maling, Clerk. By J. A.  
Schaertzer, Deputy Clerk.

No. 3627. United States Circuit Court of Appeals  
for the Ninth Circuit. Filed Jan. 6, 1921. F. D.  
Monckton, Clerk.

No. 705,844.

Patented July 29, 1902.

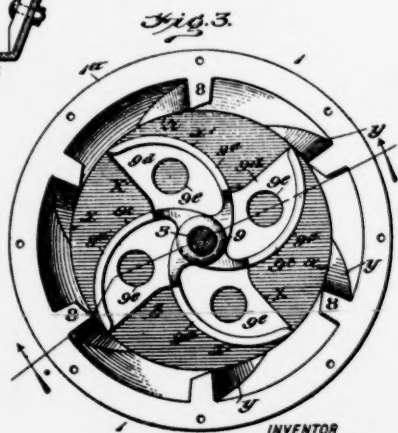
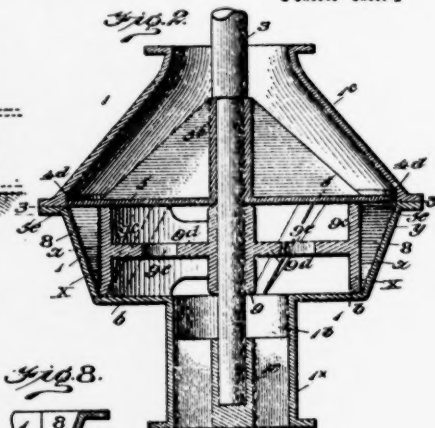
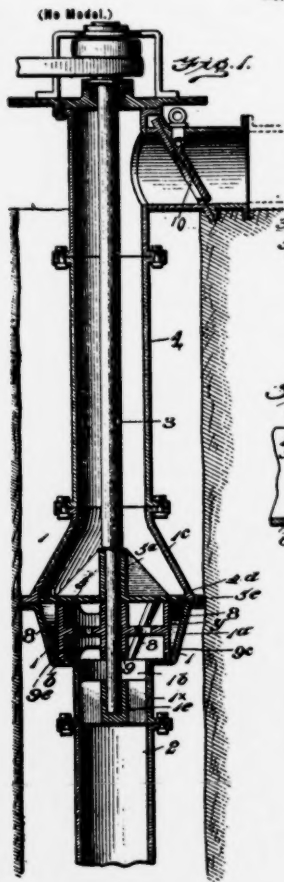
E. M. IVENS, Dec'd.

H. K. IVENS, Administrator.

PUMP MECHANISM.

(Application filed Apr. 30, 1901.)

2 Sheets—Sheet 1.



WITNESSES:

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*Ray W. Worthington*

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*Edmund M. Ivens*

BY  
*Frederick J. Listerick*  
ATTORNEY

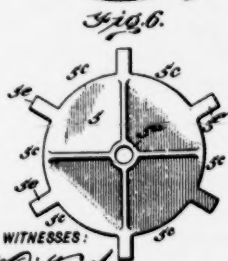
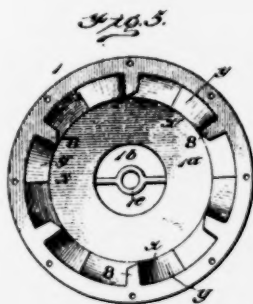
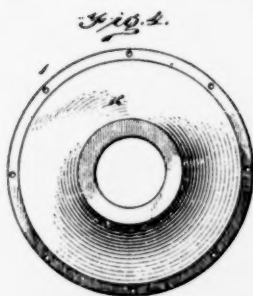
No. 705,844.

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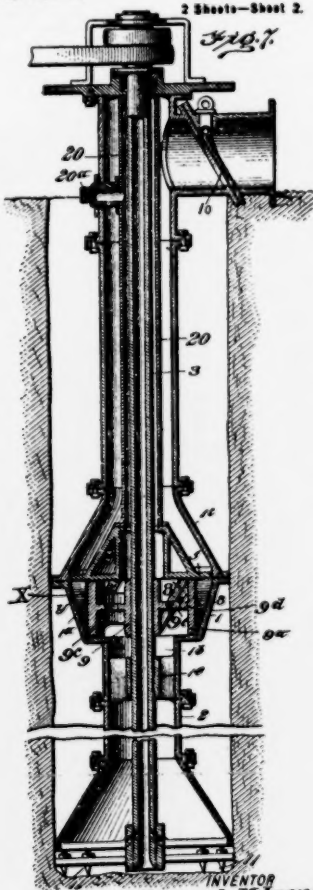
(No Model.)

2 Sheets—Sheet 2.



WITNESSES:

*H. S. Dietrich*  
*Chas. W. Worthington*



INVENTOR  
*Edmund M. Ivens*

BY *Ed. J. Dietrich & Co.*  
ATTORNEYS

## UNITED STATES PATENT OFFICE.

EDMUND MASTERS IVENS, OF NEW ORLEANS, LOUISIANA; HARRY K. IVENS, ADMINISTRATOR OF SAID EDMUND MASTERS IVENS, DECEASED.

## PUMP MECHANISM.

SPECIFICATION forming part of Letters Patent No. 705,844, dated July 29, 1902.

Application filed April 20, 1901. Serial No. 56,725. (No model.)

To all whom it may concern:

Be it known that I, EDMUND MASTERS IVENS, residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented a new and Improved Pump Mechanism, of which the following is a specification.

My present invention is in the nature of an improved centrifugally-operating pumping mechanism adapted for use in deep wells and for lifting water from bayous and lagoons for irrigating purposes; and it comprehends, generically, a casing having a lift-pipe and a discharge-pipe connected thereto, a centrifugally-operating pump-disk held within the casing, and a specially-arranged means for passing the water through the casing in an annular and upwardly-inclined direction.

My present invention in its more complete make-up also includes a novel construction of casing cooperating with the disk blades to effect a more uniform and capacious lift action than has been heretofore possible with lift-pumps having the ordinary arrangement of turbine or centrifugally-operating suction-disks.

In its more subordinate features my invention consists in certain details of construction and peculiar combination of parts, all of which will hereinafter be fully explained, and particularly pointed out in the appended claims, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical section showing my pumping mechanism especially designed for a low-lift pump. Fig. 2 is an enlarged vertical section of the casing and the centrifugally-operating pumping devices mounted therein. Fig. 3 is a horizontal section of the casing and the pump-disk, taken practically on the line 3 3 of Fig. 2. Fig. 4 is a plan view of the cap portion of the casing. Fig. 5 is a plan view of the base or receiving portion thereof. Fig. 6 is a plan view of the division bracket-plate that divides the casing into a lower receiving and an upper discharging compartment. Fig. 7 is a sectional elevation of a modified construction of my invention particularly adapted for deep wells. Fig. 8 is a detail view of a modified form of the stops, hereinafter referred to.

Referring to the accompanying drawings,

in which like numerals indicate like parts in all the figures, 1 designates a pump-casing, the peculiar construction of which, in combination with the rotary disk operating therein, forms the essential feature of my present invention. The casing 1 in practice is usually of such diameter as to permit its being slid down into the well-bore, and to facilitate its downward movement and for other reasons hereinafter explained its lower or entrant portion is made tapering, preferably on an angle of forty-five degrees to the walls of well-bore, as clearly shown in Fig. 1. The casing 1 consists of three parts—a lower receiving member 1a, in which the pump-disk operates and which has an inlet 1b, with which the lift-pipe 2 connects, an upper conical-shaped portion 1c for leading the fluid to the offtake-pipe 4, and a disk or plate 5, that divides the upper and lower parts of the casing and which also has a bracketed bearing 5a for the drive-shaft 3. In the preferred construction (best illustrated in Figs. 1 and 2) it will be observed the inlet 1b has a tubular pendant extension 1x, flanged to join with the lift-pipe and formed with the centrally-disposed step-socket 1e, in which the lower stepped end of the pump-shaft 3 seats when a solid shaft is used, as shown in Figs. 1 and 2. The socket 1e is in vertical alinement with the bearing 5a in the plate 5.

Upon the inner surfaces of the tapering sides of the part 1a of the casing is formed a number of inwardly-projecting lugs 8, the inner edges x of which are disposed in a vertical plane to oppose the outer vertical edges of the pump-disk, presently described and as best shown in Fig. 2. The front side of the lugs—i. e., the side against which the water is forced by the disk blades—inclines from the bottom of the casing forwardly in the direction of the disk rotation, preferably at an angle of forty-five degrees to the vertical axis of the pump-disk, whereby to produce annularly-inclined ways y (see Fig. 3) to deflect the fluid discharged against the said lugs annularly and upwardly to the discharge-openings 5e in the division-plate 5, the reason for which will presently appear.

When my improved pumping means is to be used for lifting water from bayous or la-

705,844

goons, it is desirable to have the guide-lugs 8 8 removably secured, whereby to provide for fitting on the casing lugs having a greater or less angle than forty-five degrees relatively to the side wall of the pump-casing, so as not to present a too abrupt stop or incline guide-surface, which might impede the passage of the debris that comes up with the water, and to provide for fitting the different lugs 8 8 in place they may be formed as separate members and bolted to the side walls of the casing, as shown in Fig. 8.

The pump-disk comprises a hub 9, held upon the shaft 3 to turn therewith, from which project in a horizontal plane a number (preferably four) of blades, the impact-faces of the pusher portion 9a of which in transverse elevation snugly fit the spaces between the rim of the inlet, the bottom b of the casing part 1a, the plate 5, and the straight bore or face of the guide-lugs 8 8, and the said portions 9a join with the hub 9 by a vertically-disposed shank 9c of reduced area and horizontal webs 9d, the webs 9d being, however, apertured, as at 9e, for a free passage of the fluid therethrough.

The plate 5, before referred to, comprises a body portion having a diameter equal that of the bore in which the disk blades travel, and said plate closes entirely over the pump-disk, it being provided with radial extensions 5e, that engage the inner vertical annular rim 4d of the cap-plate, as clearly shown in Figs. 1 and 2, said extensions serving to assist in properly positioning the plate, it being understood such plate is firmly held down by the shaft 3, that passes through its central bearing and the fluid-pressure on the top thereof. The pump-blades have their upper and lower edges held to run close against the plate 5 and the bottom of the casing, and to provide for the more effectively lifting the sand and fluid and thoroughly disintegrating the same and force same by centrifugal action against the wall of the casing the impact or pusher surfaces of the blades are vertical, as shown, and the said blades in horizontal plane are curved on a circle eccentric to the axis of the disk, with their outer or impact surfaces c' merging with the circle of the hub, as clearly shown in Fig. 3.

By constructing the pump-disk and the casing in the manner described the water-column reaches the pump-disk perpendicular and then passes off toward the annular casing-wall without a turn, and by reason of the radial inwardly-projecting stops disposed at an angle from the bottom of the casing the fluid is caused to pass up annularly at an angle of forty-five degrees, more or less, toward the outlets and through the said outlets into the conical cap portion, from whence it passes up into the outlet-pipe, which above the ground line has a discharge-lateral having a back-check valve 10, as shown.

For deep wells and for sinking wells my improved construction of pumping disk and

casing can be also advantageously used. For such purpose the casing is slightly modified, as shown in Fig. 7, by reference to which 70 it will be seen the pendent shaft bearing in the lower casing-section is tubular to permit the shaft 3 to pass down through it to the bottom of the well. In this case the hollow drive-shaft 3 also serves as a means for feed- 75 ing a loosened agent to the bottom of the well, and upon the lower end said shaft carries a disintegrating means consisting of radial toothed arms 11. In this latter form the lower end of the lift-pipe has a conical re- 80 ceiver to guide the mixed sand, gravel, &c., up into the said lift-pipe. When the disintegrator mechanism is used, a supplemental pipe 20 is mounted within the outlet-pipe that discharges into the top of the casing and 85 has a lateral supply-nozzle 20a, that projects through the outlet-pipe and terminates in a nozzle to receive the water-feed hose or pipe. The object in providing the supplemental pipe 20 is to aid in keeping the material 90 separated from clogging within the casing and pump-disk.

The disintegrating means above referred to have been described in my present application to illustrate the adaptation of my improved mechanism for deep wells, and the said disintegrating means *per se* form no part of my present invention, as they are fully disclosed in and form a part of my Patent No. 682,939, dated September 17, 1901. 100

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a pump mechanism as described; a lifting-pipe, and an outlet-pipe, a casing joining 105 the two pipes, having a central inlet at the bottom joined with the lift-pipe, and annularly-disposed outlets discharging into the outlet-pipe, projections on the inner surfaces of the casing, whose inner edges are in a 110 plane vertical with the pump-disk, said projections being inclined in the direction of the movement of the pump-disks, from the bottom of the casing up to the outlets, and a centrifugally-acting pump-disk, operating with 115 pump-casing, whose blades have vertically-disposed projecting surfaces, and whose outer extremities are held to travel close up to the vertical face of the casing projections, all being arranged substantially as shown and for 120 the purposes described.

2. In a pump mechanism as described, a pumping-casing, having a central bearing, and annularly-disposed outlets at the top, an offtake-pipe into which all of the outlets discharge, said casing having a single central inlet at the bottom, a shaft engaging the casing-bearing, a centrifugally-operating pump-disk thereon, whose blades have vertical outer edges, and curved impacting surfaces, adapted 130 to throw the fluid toward the casing-wall, guide-lugs projected inwardly from the casing, having their inner face in a vertical plane to oppose the outer vertical edge of the



disk blades, said guide-lugs being inclined from the bottom of the casing up to the annularly disposed discharge openings of the casing, substantially as shown and for the

5 purposes described.

3. In a pump mechanism as described, the combination with the casing, and the centrifugally-operating pump-disk held therein, said casing having an outlet at the top, and an  
10 inlet in the bottom, an offtake-pipe connected with the outlet, and a water-feed discharging into the top of the casing for mixing up the material lifted by the pump-disk into the casing, for the purposes described.

15 4. In a mechanism as described, the casing, the centrifugally-operating pump-blades, said casing having an annular outlet and an offtake-pipe at the top, and a central inlet at the bottom, a water-feed pipe held within  
20 the offtake-pipe, discharging into the casing, and having a feed-lateral at the upper end, projected outside the offtake-pipe, substantially as shown and described.

5. The combination with the casing, comprising a lower part having converging sides, and a central opening in the bottom, and an annular discharge in the top, an upper or cap member extended over the annular discharge and terminating with an offtake, the upper  
30 and lower members having central bearing portions, the casing having a series of inwardly-projecting guide-lugs inclined from the bottom up, and in the direction of the movement of the pump-disk and having  
35 straight inner faces; of the shaft 3, and the pump-disk mounted thereon to rotate therewith, said disk having radial webs terminating in blades, filling the lower part of the casing, their outer ends having straight edges to travel in close proximity to the straight faces  
40 of the guide-lugs, substantially as shown and for the purposes described.

6. In a pump mechanism, including a casing, joined with the intake and offtake pipes,  
45 and a centrifugally-acting pump, operating within the casing; of detachable lugs on the inner wall of the casing for deflecting the water-column upwardly at an angle, and annularly.

50 7. The combination with the intake and offtake pipes; of the pump-casing, said casing consisting of a bottom section, having its walls converging downwardly, said section having a central opening in the bottom into which  
55 the lift-pipe discharges, a series of radially inwardly projecting guide-lugs on the wall of said casing section, said stops being inclined upwardly at an angle in the direction of the movement of the pump-shaft and having vertical faces, said lower section having an annular discharge with which the said lugs co-

operate, said discharge connecting with the offtake; of the shaft 4, the pump-disk mounted thereon, said disk comprising a hub, webs projected radially therefrom, blades forming an integral part of the webs, having their upper and lower edges running close to the top and bottom walls of the lower casing-section, and their vertical edges adapted to run close to the vertical face of the guide-lugs, all being arranged substantially as shown and described.

8. The combination with the intake and offtake pipes, and the drive-shaft; of the pump-casing, consisting of a lower section having a central pendent portion formed with a step-bearing to receive the drive-shaft, said lower section having its vertical wall diverging upwardly, a series of inwardly-projecting lugs on said wall, said lugs extending the full height of the said section, and inclined upwardly in the direction of movement of the shaft, and having their inner faces straight-faced, the pump-disk, having radial blades, whose upper and lower edges are adapted to run close to the top and bottom of the lower section, and its outer edges straight-faced, to run close to the straight faces of the aforesaid lugs, the top wall of the lower section having an annular discharge in line with the said lugs, and an upper casing-section, adapted to receive the fluid discharged from the lower section, and deflect it to the offtake, as set forth.

9. As an improvement in pumps of the character described, a pump-casing comprising a bottom part having a central inlet in the base thereof, a pendent portion joined with the inlet, and adapted to connect with the lift-pipe, said portion having a central bearing member 5, and a solid disk part of a diameter equal that of the pump-disk, and adapted to form the top of the disk-holding chamber of the casing, said member 5 also having radial projections 5a, to extend over the annular discharge from the disk chamber, a cap member 1c, the shaft 3, journaled in the bearings 5a and 1c, of the member 5 and the pendent portion aforesaid, respectively, the pump-disk having blades, whose upper and lower edges travel close to the plate 5, and the bottom of the disk chamber, and guide-lugs projected radially inward from the walls of the casing into the disk compartment thereof, the inner faces of which oppose the outer vertical edges of the disk blades, all being arranged substantially as shown and for the purposes described.

EDMUND MASTERS IVENS.

Witnesses:

J. N. BOLAND,  
O. L. BOZEMAN.



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A detailed technical drawing of a vertical steam engine mechanism. The drawing is a cross-section, showing the internal components. At the top is a large, rounded cylinder (the boiler or steam chest) with a small dome on top. Below this is a piston rod connected to a piston. The piston is shown in a vertical position. The piston rod is connected to a connecting rod, which is in turn connected to a crankshaft. The crankshaft is shown in a horizontal position. The entire mechanism is mounted on a sturdy frame. At the bottom, there is a large flywheel. The drawing is labeled with various letters and numbers, indicating different parts of the engine.

[illegible]

[Endorsed]: Case No. 485. Defendants' Exhibit "M-6." Filed Feb. 25, 1920. W. B. Maling, Clerk. By J. A. Schaertzer, Deputy Clerk.

No. 3627. United States Circuit Court of Appeals for the Ninth Circuit. Filed Jan. 6, 1921. F. D. Monckton, Clerk.



[Endorsed]: Case No. 485. Defendants' Exhibit "M-74." Filed Feb. 25, 1920. W. B. Maling, Clerk. By J. A. Schaertzer, Deputy Clerk.

No. 3627. United States Circuit Court of Appeals for the Ninth Circuit. Filed Jan. 6, 1921. F. D. Monckton, Clerk.

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**Defendants' Exhibit "N."**

[Endorsed]: No. 485—Eq. Defts. Exhibit "N." Filed Sept. 3, 1920. W. B. Maling, Clerk. By J. A. Schaertzer, Dep. Clerk.

No. 3627. United States Circuit Court of Appeals for the Ninth Circuit. Filed Jan. 6, 1921. F. D. Monckton, Clerk.

This Contract made March 24th, 1915, between Layne & Bowler Corporation, first party and S. M. Halstead, second party,

**WITNESSETH:**

That the following charges by the first party against the second party are correct:

Balance on open account, as	
shown by first party's	
books .....	\$4080.16
Note given for gas rig.....	3500.00
Note given for gas Engine.....	500.00
Bill for screen (not yet on ledger)	624.24
Balance due on Halstead and	
Vaughan Account .....	383.24
Note given 1/15/15 .....	1766.87
<hr/>	
Total .....	10850.51

That the following credits to the second party are correct:

Credits shown first party's account called "S. M. Halstead Cash Report Account" ..\$1268.94

Second party's bills of following Date:

10/28-14 .....	29.22
10/28-14 .....	61.00
11/20/14 .....	.60
11/24/14 .....	30.05
11/20/14 .....	23.12
10/ 1/14 .....	62.60
2/ 1/15 .....	59.00

Credit due second party on first party's over-charge on charge dated 2/5/15, No. 14-564 ..... 80.65

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Total . . . . . 1615.18

Excess of said charges over said credits. . . \$9235.33

Conditional upon the second party's returning the Kirkwood pump to consignment in good shape, first party agrees to allow the second party a further credit of ..... 1865.00

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Net Excess of said charges over said credits .....\$7370.33

In settlement of the above, the first party agrees to accept the following: and the second party agrees to deliver the same:

Gas Rig mentioned above, for . . . 2600.33

Forty-nine (49) shares of Layne  
and Bowler Corporation  
stock for . . . . . 3920.00

Gas Engine mentioned above for 500.00

Cash, represented by a seven per-  
cent (7%) interest bearing  
demand note of like date,  
with this instrument . . . . . 360.00

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7370.00

Above mentioned Gas Rig and Gas Engine to be delivered f. o. b. cars San Jose, California.

It is morally understood that the said Three-hundred-fifty dollar demand note is to be paid as soon as the second party can straighten up his affairs in the North, and, if impossible for him to meet it all at that time, the balance is to be handled by monthly payments, but nothing herein shall strip the note of any of its qualities as a straight demand note.

In consideration of the second party rendering his personal services free of charge for closing up the first party's affairs in its so called Northern territory, the first party agrees to cancel all charges for use of its Automobile and furniture by the second party.

The second party hereby releases and grants back to the first party all his right, title and interest in that certain contract October 1st, 1914, between the

Layne & Bowler Corporation and S. M. Halstead and P. E. Vaughan; and in consideration of the premises, the first party hereby agrees not to charge any of the second party's accounts with any transactions which may be hereafter had under the said contract.

Executed in duplicate.

**THE LAYNE & BOWLER CORPORATION.**

By A. E. MULFORD,

2d Vice-President and Assist. Gen. Mgr.

First Party.

And S. M. HALSTEAD.

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**Defendants' Exhibit "O."**

[Endorsed]: No. 485—Eq. Defts. Exhibit "O."  
Filed Sept. 3, 1920. W. B. Maling, Clerk. By J. A. Schaertzer, Dep. Clerk.

**THIS AGREEMENT**, Made and entered into this nineteenth day of September, 1916, by and between the Western Well Works, Inc., a corporation organized and existing under and by virtue of the laws of the State of California, with its principal place of business at San Jose, California, hereafter known as the party of the first part, and the Layne & Bowler Corporation, a corporation organized and existing under and by virtue of the laws of the State of California, with its principal place of business at Los Angeles, California, the party of the second part.

**WITNESSETH:** That for and in consideration of One (\$1.00) Dollar, each to the other paid, the receipt whereof is herewith acknowledged, and in consideration of other valuable consideration moving to each of the parties, do hereby agree as follows, to wit:

(1) That on or before October 10th, 1916, the party of the first part agrees to, and will cause to be loaded by Southern Pacific Railroad Company, and consigned, charges collect, to the party of the second part at Los Angeles, California, (or such other shipping point as party of the second party may hereafter direct), a certain well rig and accessories thereto, in good workable condition, as covered by a certain inventory which is attached hereto and made a part hereof.

(2) The party of the first part further agrees to execute and deliver herewith, a good and sufficient bill of sale to the party of the second part, to a certain 40 H. P. high pressure mounted boiler, and a certain mounted steam draw-works, consisting of running gear, frame, steam engine, drum, sprockets, etc., the same now being situated in the yards of the party of the second part in Los Angeles.

(3) The party of the second part agrees to deliver herewith to the party of the first part, receipted memorandums cancelling indebtedness of any kind or nature, which the party of the second part may have against first party or S. M. Halstead of San Jose, California, or P. E. Vaughan of San Jose, California; and further agrees to deliver within five days to the Western Well Works, Inc. any notes or other evidence of indebtedness which S. M. Halstead or P. E. Vaughan, or either of them, may have given to the party of the second part, and which now remain unpaid.

(4) Party of the second part further agrees to deliver herewith a good and sufficient bill of sale of any right, title or interest which they may have in a



certain well drilling rig and equipment, now located at Salinas, California, in storage at Cornett's Brothers Yard, together with written orders upon Cornett Brothers to deliver said well drilling rig and equipment to the order of the party of the first part.

(5) Said second party further agrees to assume and pay all hauling charges which were incurred incident to the removal of the well rig from the Bardin ranch to Cornett Brothers Yard, and also pay all storage charges due to Cornett Brothers to date.

(6) The party of the first part agrees to dismiss the suit now brought at Salinas against the second party, and both parties hereto agree to relinquish any claim for damage or liability, which either party may have, the one against the other, arising out of such transaction.

IN WITNESS WHEREOF, said parties have hereunto set their hands and seals in duplicate the day and year first above written.

WESTERN WELL WORKS, INC.,

Per S. M. HALSTEAD.

[Seal of Western Well Works, Inc.]

LAYNE & BOWLER CORPORATION,

Per W. E. BOWLER,

Sec'y.

Witness:

NELLIE M. CALL.

B. L. ROBERTS.

**Defendants' Exhibit "S."**

In the United States District Court, Southern  
District of California, Southern Division.

IN EQUITY—No. E-42.

LAYNE & BOWLER CORPORATION,  
Plaintiff,

vs.

AMERICAN WELL & PROSPECTING COM-  
PANY, ISAAC N. JOHNSTON and FRANK  
R. GALBREATH, Doing Business as King  
MACHINE & MANUFACTURING COM-  
PANY,

Defendants.

**Master's Report.**

To the Hon. OSCAR A. TRIPPET, Judge of said  
Court:

This is a suit brought November 18, 1919, in the District Court of the United States, Southern District of California, Southern Division, by the plaintiff Layne & Bowler Corporation, against American Well & Prospecting Company, Isaac N. Johnston and Frank R. Galbreath, doing business as King Machine & Manufacturing Company, for the infringement of Claims 9, 13 and 20 of letters patent of the United States issued to one Mahlon E. Layne, the assignor of the plaintiff, May 29, 1906, upon application for letters patent filed by him April 28, 1903, for a well mechanism, No. 821,653.

The evidence, unobjected to, while otherwise not altogether satisfactory, demonstrates that the plain-

tiff, Layne & Bowler Corporation, is the owner by mesne assignments of the patent issued to Mahlon E. Layne May 29, 1906, as aforesaid, and I therefore find that the plaintiff is the owner of the patent in suit and entitled as such to bring this action.

On the 8th day of December, 1919, a restraining order was entered herein that pending the hearing and determination of plaintiff's motion for a temporary injunction restraining and enjoining defendants as prayed in the bill of complaint, said defendants, and each of them, their attorneys, officers, agents, servants, employees, associates, confederates and workmen, and each and every one thereof, should be enjoined and restrained and commanded to desist from manufacturing, using or selling or causing to be manufactured, installed, used or sold any well mechanism embodying or containing the invention patented by letters patent No. 821,653, dated May 29, 1906, for well mechanism as particularly set forth in Claims 9, 13 and 20 thereof, or either thereof, which said claims are as follows:

"9. In well mechanism the combination with a pump casing, of a rotary pump of a jointed pump shaft and a closed casing surrounding the pump shaft from the pump to the top of the well."

"13. The combination with a pump and its actuating shaft of a sectional casing therefor provided at each end of each section with a fixed block with bearings for the shaft, the casing being closed at the top and provided with an air vent."

"20. The combination of a well casing, a ro-

tary pump therein, and a line shaft for the pump entirely closed off from the water in the well."

or any mechanism or parts thereof capable of or intended to be combined in well mechanism in infringement of said letters patent, particularly of either Claim 9, 13 or 20 thereof and that plaintiff's said motion for temporary injunction should be continued.

Subsequently on the 29th day of December, 1919, it was ordered that the cause should be referred to the undersigned as Special Master to hear the evidence and decide all the issues between the parties and make his report to this court, separately stating his findings of law and fact, together with all the evidence introduced before him, which evidence should become part of the record; with all powers as provided by the equity rules.

It was further ordered that said Special Master should have full power to hear and determine all motions or applications respecting amendments to the bill of complaint or answer, or any procedure, with the same effect as though made and determined by this court; and the motion to dissolve the restraining order theretofore made was likewise referred to said Special Master to be determined as said Special Master should order.

And being now ready to report in said matter pursuant to said orders aforesaid, I, Lynn Helm, appointed Special Master as aforesaid, do respectfully report that I have on divers and sundry days between the second day of January, 1920, and the date hereof, been attended by the several parties to said suit, the said plaintiff, Layne & Bowler Corporation by Frederick S. Lyon, Esq., and Leonard S. Lyon, Esq., at-

torneys for plaintiff, and said defendants by Charles C. Montgomery, Esq., and Raymond Ives Blakeslee, Esq., attorneys for defendants, and having heard all the evidence produced before me by said respective parties, and having heard the argument of counsel, and being fully advised in the premises, do report as follows:

At the time said reference was made to the undersigned, there was in full force and effect the restraining order hereinbefore mentioned, and thereafter and on several occasions the defendants moved to dissolve said restraining order, but following the practice laid down in — Fed. —, I declined to dissolve said restraining order until further evidence had been produced before me as to the right of said defendants to have said restraining order dissolved and accordingly continued said restraining order in effect.

There was at the time of the making of said restraining order no injunction bond required of the said plaintiff and on the tenth day of January, 1920, a motion was made by the defendants that plaintiff be required to give a bond and thereupon I made an order requiring said plaintiff as a condition of continuing said restraining order to file an injunction bond in the usual form in the sum of \$5,000, conditioned for the payment of any damages that the defendants should suffer by reason of continuing said temporary restraining order. This bond was accordingly given by the plaintiff and approved by the Master. Subsequently on the 24th day of January, 1920, a further motion was made to dissolve said restraining order and upon hearing said motion, it was ordered in accordance with the practice of this court

thereof that the restraining order heretofore made by this court on December 8, 1919, should be kept in force and effect and that plaintiff should give as additional security a bond in the sum of \$10,000 conditioned that if the court should determine the restraining order was wrongfully issued or made or that the conditions of said restraining order was erroneous, the plaintiff would answer, make good and pay to the defendants any and all damages which may be suffered by said defendants or either of them. At the same time it was ordered, as an alternative, in accordance with the practice of this court and by the practice established by the Circuit Court of Appeals for the Sixth Circuit, in Toledo Plate and Window Glass Co. vs. Kawneer Manufacturing Co., 262 Fed. 510, that if said defendants would give a bond payable to the plaintiff in the sum of \$30,000 conditioned to pay all profits that might accrue to plaintiff or all damages that might be sustained by the plaintiff by reason of its being determined that said patent owned by the plaintiff was infringed by the defendants, and then and in that event the restraining order theretofore issued should be dissolved and no further restraining order should be issued for the time being. As will hereafter appear the astute manager of said defendants declined to give said bond last mentioned and the plaintiff having given a bond in the said sum of \$10,000 as aforesaid, the said restraining order was continued in full force and effect and still continues in full force and effect and undissolved.

I have proceeded to hear the evidence produced on behalf of the parties hereto respectively, evidence

being taken pursuant to orders made herein, at my office in Los Angeles, at San Francisco, California, at Madison, at Milwaukee, in the State of Wisconsin, at Chicago, in the State of Illinois, and at Philadelphia, in the State of Pennsylvania, all of which evidence is reported and returned herewith in depositions and testimony taken in open court, the latter in three volumes, which is all the evidence taken in said cause, and which evidence with all exhibits accompanying the same I return herewith.

From said evidence it appears as follows:

The mechanism controlled by the plaintiff and described in the patent aforesaid is for an invention relating to an apparatus used for drawing water from driven or artesian wells and particularly for the means of adjusting the pump therein.

The structure is a centrifugal pump construction which is designed and adapted to be inserted in a deep well casing of small diameter and to be freely suspended as a unit from the pump head at the surface of the ground and to be manipulated therefrom. The patent provides for maintaining and protecting the pump and the shaft in a closed casing which is to be operated from the top. The adjustment and lubrication of the well mechanism are specially provided for and in addition thereto it provides for the protection of the bearings and shafting after the pump has been lowered into a well hold and without the necessity of removal therefrom. The closure of the pump and its lubrication are particular features of the structure and the methods used by Layne are carefully to be considered. It provides for the use of a shaft wherein were intermediate bearings, lubri-

cated from top to bottom by gravity and protected from water and sand and other detritus in the well, by being enclosed in a casing which excluded both sand and water and other detritus from said bearings and shaft. In actual operation to secure a perfect alignment of the shaft a system of wedges and spiders held the well mechanism in position when adjusted. The suspension also of the well mechanism from the top kept the shafting in alignment, and there was added stiffness given to the inward drive shaft by the downward thrust and its weight. This downward thrust helped to effect the closure of the lower bearing against the entrance of sand and water. The specifications of the patent showed that Layne relied upon stuffing-boxes also at the top and bottom of the shaft to effect a closure and to prevent entrance of water and sand to the detriment of the shaft and bearings.

Layne in his invention has met the difficulties that were interposed up to that time. As we have said before, he did this by the use of a jointed shaft with intermediate bearings, lubricated from the top to the bottom by gravity, and protected from the water and sand of the well by being enclosed in a casing which excluded both sand and water from the bearings and shaft. He accomplished its adjustment to a vertical position in the well hold by suspending the shaft pump and casing from the top of the well and by a system of wedges holding the well mechanism in position when adjusted. The suspending of the well mechanism from the top also enabled Layne to keep the shaft in alignment through the added stiffness given by the downward thrust and the weight of the



pump and shaft. This downward thrust also helped to effect the closure of the lower bearing against the entrance of sand and water. There was also provided and relied upon stuffing-boxes at the top and bottom of the shaft to effect the closure and prevent the entrance of water and sand to the detriment of the shaft and bearings. We have then a complete arrangement of a closed shaft, the alignment of the shaft in the well casing, a provision for lubrication for the shaft and bearings and the protection of the shaft and bearings from water and sand.

The claims of the patent which are in *controversy* in this case or claimed as infringed are, Claims 9 13 and 20 above mentioned.

Validity has been given to these claims in the cases of El Campo Machine Co. vs. Layne, 195 Fed. 83, Van Ness vs. Layne, 213 Fed. 804, and in the recent case of Getty vs. Layne, 262 Fed. 141, all in the Circuit Court of Appeals in the Fifth Circuit, and also in the case of the United Well Works vs. Layne, — Fed. —, in the Eighth Circuit, a memoranda decision.

In the Getty case, *supra*, the enclosed line shaft was defined as having the three functions, (1) aiding of the alignment of the shaft in the well casing, (2) providing for lubrication of the shaft and bearings, and (3), protecting the shaft and bearings from water and sand.

In this Getty case also the question of adjustment entered into the discussion of the case and the enclosed shaft of Claim 20 was restricted by referring it to the character of closed line shaft claim described in the specification of the patent.

In the patent the shaft is described as a jointed shaft, with top, intermediate, and lower bearings, means of adjustment and fixation, means for lubrication, means for alignment in the well, and means for preventing water and sand from reaching the shaft and bearings. It appears therefore that there is a complete closure in the Layne patent.

It is not contended that the Layne patent is a pioneer patent.

While it is not a pioneer patent, yet the broad language of the claims is unlimited and it is entitled to a wide range of equivalents. This disposes of the idea, that the actual construction of the mechanism does not in all respects follow the specifications of the patent, and that it is necessary to enlarge the range of equivalents in order to enlarge the idea of the patent. It is not necessary to enlarge the patent upon the idea that it is a pioneer patent. It is an advance over anything that was previously constructed or patented and in itself shows novelty, especially in respect to alignment, lubrication and closure as we shall hereafter point out.

Apparently the defendant's pump also accomplished its alignment by suspension of the mechanism from the top of the well; but it is also claimed that the shaft casing received its support by resting on the top of the pump bowls. There is evidence to the effect that because of this tension of the shaft casing on the top of the well exceeded but a few pounds.

When this case was first commenced and the

injunction granted herein there is little doubt that there was an infringement by the defendants of the respective methods used by Layne for alignment, lubrication and closure.

In addition to the defenses made in the El Campo, Van Ness, Getty and United Well Works cases, *supra*, either as to the validity of the Layne patent or the infringement by the defendants, the defendants herein have set up and alleged that the Layne patent was invalid because Mahlon E. Layne was not the true or original or first inventor of said well mechanism patented under said Letters Patent, and also alleged that prior to the alleged invention of Mahlon E. Layne, and prior to his filing application for patent in the Patent Office, the said Claims 9, 13 and 20 of the alleged patent were in fact invented by Byron Jackson and Frank Jackson, the owner and employee respectively, of the Byron Jackson Machine Works of San Francisco, Cal., who were using reasonable diligence in adapting and perfecting said invention and that while the application for said Letters Patent of Mahlon E. Layne was pending, said Mahlon E. Layne so limited and confined the claims of said application that he was not entitled to seek for or obtain a construction for such claims sufficiently broad to cover the construction used by defendants.

There was also set up and alleged that there was prior use of said claims and publication thereof by letters patent of the United States mentioned in letters patent No. 522,518 granted to S. M. Eisler July 3, 1894; No. 735,692 granted to J. W. Alvord

August 11, 1903, and 705,844 granted to E. M. Ivens July 29, 1902, and by certain machines manufactured and sold by Byron Jackson Machine Works of San Francisco, Cal., at different dates in the years 1901 and 1904.

It is also alleged by the defendants that Mahlon E. Layne surreptitiously or unjustly obtained said letters patent for that the machine therein mentioned was in fact invented by Frank Jackson and Byron Jackson, aforesaid, and the claims aforesaid mentioned were not new when produced by said Mahlon E. Layne, and that said claims were patented previously by divers and sundry persons mentioned in the answer of defendants and particularly by Crannell No. 425,933, April 15, 1890, Cavellero No. 524,666, August 14, 1894, and others, and that the alleged and pretended inventions as claimed in letters patent No. 821,653 and especially claims 9, 13 and 20 thereof were in public use and sold or constructed and successfully operated in the United States of America prior to the pretended application of said Layne for said letters patent, by Byron Jackson, Frank Jackson, and the Byron Jackson Machine Works of San Francisco. As to this latter phase of the case, reference is especially had to the amended answer filed by the defendants by leave of court March 15, 1920, wherein were had both the defenses of prior invention and prior use and are distinctly set forth as grounds for the invalidity of said patent.

At the threshold of this investigation we are confronted with the assertion or contention of the plain-

tiff that all the questions presented to and decided by the Circuit Court of Appeals of the Fifth Circuit in the foregoing cases of El Campo, Van Ness and Getty vs. Layne, and in the Eighth Circuit in the foregoing case of United Well Works, *supra*, were determinative of the questions therein presented and therefore are conclusive as to the validity of said letters patent issued to Mahlon E. Layne except as attacked by the alleged prior invention and prior use of the pump mechanism by Byron Jackson and Frank Jackson or the Byron Jackson Machine Works. It is contended on behalf of the plaintiff that the decisions of the Circuit Court of Appeals are binding upon this District Court in its determination of this case in the absence of any decision by the Circuit Court of Appeals of the Ninth Circuit in reference thereto.

It is urged by counsel for plaintiff that we should adopt the rule laid down in Schmeiser Manufacturing Company vs. Lilly, 189 Fed. 631, that where the validity of the patent has been before the Circuit Court of other districts and in both cases was contested, this court will not examine anew the question which has been thus adjudicated, for it is said, in patent cases conclusive effect is accorded by each of the Circuit Courts of the United States to a prior judgment of any one of them, whatever the patent, the question, and the evidence are the same in both cases. See, also, Office Spec. Mfg. Co. vs. Winternight, 67 Fed. 928, and Wanamaker vs. Enterprise Manufacturing Company, 53 Fed. 791.

But this is a question of comity only and we

think that the plaintiff overstates somewhat the claims of comity. For the reasons given we prefer the language of Mr. Justice Brown speaking for the Supreme Court in the case of *Mast Food Company vs. Stover Manufacturing Company*, 177 United States, 485, which reads:

Comity is not a rule of law, but one of practice, convenience and expediency. It is something more than mere courtesy, which implies only deference to the opinion of others since it has a substantial value in securing uniformity of decision, and discouraging repeated litigation of the same question. But its obligation is not imperative. If it were, the indiscreet action of one court might become a precedent, increasing the weight with each successive adjudication, until the whole country was tied down to an unsound principle. Comity persuades; but it does not command. It declares not how a case shall be decided, but how it may with propriety be decided. It recognizes the fact that the primary duty of every Court is to dispose of cases according to the law and the facts; in a word, to decide them right. In doing so the Judge is bound to determine them according to his own convictions. If he be clear in those convictions, he should follow them. It is only in cases where, in his own mind, there may be a doubt as to the soundness of his views that comity comes in play and suggests a uniformity of ruling to avoid confusion, until a higher court has settled the law. It demands of no one that he shall abdicate his individual judgment, but only that deference shall be paid to the judgments

of other co-ordinate tribunals. Clearly it applies only to questions which have been actually decided, and which arose under the same facts.

The obligation to follow the decisions of other courts in patent cases of course increases in proportion to the number of courts which have passed upon the question, and the concordance of opinion may have been so general as to become a controlling authority. So, too, if a prior adjudication has followed a final hearing upon pleadings and proofs, especially after a protracted litigation, greater weight should be given to it than if it were made upon a motion for a preliminary injunction. These are substantially the views embodied in a number of well-considered cases in the Circuit Courts of Appeals. *Macbeth vs. Gillinder*, 54 Fed. Rep. 169; *Electric Manufacturing Company vs. Edison Electric Light Company*, 61 Fed. Rep. 834; S. C., 18 U. S. App. 637; *Edison Electric Light Company vs. Beacon Vacuum Pump and Electric Company*, 54 Fed. Rep. 678, and cases cited.

I am influenced in the decision which I have come to by the following citations: In *Vacuum Cleaner Company vs. Thompson Manufacturing Company*, 258 Fed. 239; Judge Wade writing the opinion of the Court, held:

"A Federal District Court will follow the ruling of the Circuit Court of Appeals of another circuit where the matter has not already been before the Circuit Court of Appeals of the circuit in which the lower court is sitting."

The Court said:

"Counsel for defendants state the issue herein thus: Does the prior art disclose a so-called suction or vacuum having an inlet head characterized by a narrow inlet slot so arranged that its boundaries are adapted to be brought into sealing contact with the surface to be cleaned? Answering this question in the affirmative, counsel rely principally upon three patents (naming them). This case might well be disposed of upon the following adjudications: (Citing three or four.)

Not any of these cases constitute an adjudication as against this defendant; but, as a rule, a District Court will follow the ruling of the Circuit Court of Appeals of another circuit where the matter has not already been before the Circuit Court of Appeals of the Circuit in which the trial court is sitting."

It was said by Judge Dallas in the case of *Office Specialty Manufacturing Company vs. Woodernight*, 67 Fed. 928:

"This court will not examine anew the question which has thus been adjudicated, but will accept the decisions referred to as determinative of the effect of the evidence upon which they were based. (Citing *Wanamaker vs. Enterprise Manufacturing Company*, 53 Fed. 791.) If the rule here adverted to were one of comity merely, it would, I think, be impossible to justify its derogation from the right of suitors to the veritable judgment of the tribunal to which any particular case is confided for decision. Upon general questions of law the views of courts of co-ordinate jurisdiction are always



regarded with respectful consideration, but not as controlling. In patent cases, however, conclusive effect is accorded by each of the circuit courts whenever the patent, the question and the evidence are the same in both suits, not on the ground of comity alone, but with the practical and salutary object of avoiding repeated litigation and conflicting decrees."

And in the case of National Cash Register Company, 53 Fed. 370, the Court said:

"The Court whose decree is the subject of this appeal expressed no independent opinion, but merely followed the decision of the Circuit Court for the District of Massachusetts in a suit in which the same claim had been in controversy. (National Cash Register Company vs. Boston Indicator & Recorder Company, 45 Fed. 481-5.) The course pursued in that regard was in conformity with the rule well established in this circuit to follow, unless under extraordinary circumstances, a prior judgment of another of the circuit courts of the United States, whenever the patent, the question and the evidence are the same in both suits. We do not question the propriety of this practice as it has heretofore prevailed, but it cannot be extended to this court."

An exhaustive examination of the record herein and the decisions of the Circuit Court of Appeals of the Fifth and Eighth Circuits upon the questions therein presented respectively are convincing that those decisions are binding upon this court in the absence of a decision of the Circuit Court of Ap-

peals of the Ninth Circuit, or until it shall hold otherwise;

Therefore, we have concluded that the Layne patent is in all respects valid in favor of the plaintiff, except as we should now determine that it is invalid by reason of the prior invention and prior use of said pump mechanism by Byron Jackson, Frank Jackson and the Byron Jackson Machine Works, as urged by the defendants, all other questions as to the validity of said patent having been previously asserted and determined in the several cases above mentioned which were determined by the Circuit Courts of Appeals for the Fifth Circuit and Eighth Circuit.

Again, carefully examining the evidence bearing upon the question of the validity of the patent in question, we have come to the conclusion and so find that the Layne patent is in all respects valid, as the evidence offered in the three cases before the Circuit Court of Appeals of the Fifth Circuit and the one case that was presented in the Eighth Circuit discloses. However, we now must approach the case from the view of the record here presented, wherein it was claimed that the patent was invalid by reason of the prior invention and prior use of said pump mechanism by Byron Jackson, Frank Jackson, and the Byron Jackson Machine Works as urged by the defendants. So far as we have been able to examine the records in the cases presented in the Circuit Court in the Fifth Circuit and in the Eighth Circuit in what may be known as the El Campo, Van Ness and Getty cases in the Fifth

Circuit and the United Well Works case in the Eighth Circuit, all other questions as to the validity of said patent were previously asserted and determined in the several cases above mentioned by said Circuit Court of Appeals.

The question presented as to the defense of the prior invention and prior use by Byron Jackson and Frank Jackson and the Byron Jackson Machine Works of the mechanism involved herein is first presented in this case and it becomes necessary to determine the validity of that defense. The defense herein proposed involves either that the Byron Jackson pump or the mechanism there involved was fully completed and installed, as well as described in drawings prepared by Byron Jackson prior to the application of Mahlon E. Layne for patent April 28, 1903, because there never was any application made for any patent upon the Byron Jackson pump. Byron Jackson depended solely for his claim of invention on drawings and designs which he made of the pump and subsequently the completed manufactured structure. At the time that Layne applied for the patent in question there was no complete conception of the Jackson structure. The evidence shows beyond question that it was not until late in the year 1903, and not earlier than October of that year that Byron Jackson was still working upon the device in question and had not satisfactorily completed the same until after that time. Plans had been drawn for a deep well pump mechanism consisting of a closed line shaft as early as March 5, 1902; but Byron Jackson

shows by letters which he wrote during the year 1903 that he had not completed the structure and it was not until after April 28, 1903, that a general drawing was made of the Jackson mechanism for the purpose of installation by Byron Jackson for the Pabst Brewing Company for the purpose of showing the shaft, shaft casing, discharge casing, pump bowls and bearings for the shafts, but in October, 1903, Jackson sent his workmen for the first time to Milwaukee, Wis., for the purpose of installing such a plant as he had designed and the structure of which was then practically completed for the Pabst Brewing Company.

The question presented by this record as to the defense of the alleged prior invention and prior use by Byron Jackson and Frank Jackson and the Byron Jackson Machine Works of the mechanism involved is the first proposition that must be determined in this case.

The law is well settled that the date of the patent of an invention is at least as early as the date of the application provided it sufficiently describes the invention to enable those skilled in the art to understand it. "Patented inventions always date at least as early as the dates of the execution of the original applications therefor, provided the original applications exhibit the inventions with the above mentioned extent of sufficiency." Walker on Patents, Fourth Ed., sec. 70.

We have therefore, in this Layne case a subsequently patented invention as a completed invention April 28, 1903; it is an invention which is

perfected and adapted to use, or which is expressed, constructively reduced to practice. The Byron Jackson conception was not reduced to practical use before that time, and Byron Jackson did not seek to secure any patent thereon. As early as May 6, 1901, he erected a sludge pump with a separate discharge pipe and shaft casing with intermediate bearings and erected it in a well of a hotel in San Francisco. A drawing of this was made, but the description of it is so vague and having been destroyed by the San Francisco earthquake, the pump itself is not in existence; the testimony is not clear as to its absolute construction or that others were instructed in its use or how successful was its operation. It is not repeated and no application was made for a patent upon it.

On March 5, 1902, a drawing was made by Byron Jackson of a pump with an inner shaft casing surrounded by a concentric discharge casing, but at that time Byron Jackson did not construct any pump according to said drawings. Subsequently on April 20, Byron Jackson while working upon the drawings of said pump agreed to make a pump for the purpose for which it was intended, for the Pabst Brewing Company of Milwaukee, but it was not completed until subsequent to the 1st of October, 1903. It was installed and furnished under the Pabst contract, and in running order January 12, 1904. There was no patent applied for prior to its installation on January 1, 1904, it had not been reduced to practice.

Byron Jackson was not therefore entitled to

protection as an inventor, as he had not embodied the idea into a practical machine and reduced it to practical use and I find he did not anticipate the Layne patent applied for and allowed as aforesaid. The Jackson conception not having matured and ripened into an allowable patent and no completed machine being shown of the Byron Jackson conception nor having been put into practice prior to the Layne application, it must be held that Jackson's conception did not in anywise invalidate the Layne patent. *United States Metallic Packing Company vs. Hewitt Company*, 236 Fed. 739.

The Alvord defense based upon the patents issued to Alvord in 1902 was also before the Circuit Court of Appeals in the *El Campo*, *Van Ness* and *Getty* cases above mentioned, and has been interpreted, construed and passed upon; and it has been held that the Alvord defense is not an anticipation of the Layne Patent. In his patents were all that he had in the line of invention, he had other ideas, but they had never reached the state of completed inventions. The two sketches as made by Alvord and testified to in the *Whittesley* deposition were never completed inventions. Alvord never devised an enclosed tube for his proposed shafting. Alvord never had any idea of alignment, lubrication or closure against sand, water and detritus as is exhibited in the Layne patent.

We are confronted of all that remains, therefore, with the questions whether the methods used by Layne of alignment, lubrication and closure have been infringed by the defendants.

It must be acknowledged that the feature of the Layne patent is the combination of a well casing, a rotary pump therein and a shaft for the pump entirely closed off from the water of the well. We have already given validity to this claim and it should be again defined as a closed shaft having three functions of (1) aiding the alignment of the shaft in the well casing; (2) providing for lubrication for the shaft and bearings; (3) and protecting the shaft and bearings from water and sand. It is the infringement of these in combination that is fatal to the defendants.

The defendants have infringed upon the enclosed line shaft of plaintiff's patent for there is in the defendants' structure a jointed shaft with top, intermediate and lower bearings, means of adjustment and fixation, means for lubrication and means for alignment in the well.

In the defendant's structure I find as follows: The pump column or water discharge pipe is screwed into the pump neck and is cut into ten-foot lengths; about five inches of the column couplings also act as the spider guide. The protective tubing that surrounds the shaft is cut into five foot lengths with a bronze bearing every five feet. The drive shaft is cut in ten-foot lengths united by threaded couplings. At its lower end this drive shaft is coupled to a stub shaft which is connected to the pump runner. A five-inch long sleeve bearing surrounds the sub shaft, from a point above the pump neck down into the pump neck where such sleeve bearing screws into the pump neck. To the outside

of this bearing and above the pump neck the lower end of the protective tubing is screwed, making a tight joint. The working clearance between the inner or bearing surface of this sleeve bearing and the periphery of the stub shaft is a working fit,—the clearance being but a  $1/64$  of an inch. Below this sleeve bearing and within the pump neck is a piston ring provided to further prevent passage of water or sand upward, or the passage of oil downward, except through the hollow runner shaft. The sleeve which surrounds the stub shaft below the five-inch sleeve bearing, before mentioned, and which carries the piston ring is held in contact with the last named sleeve bearing by a spring which exerts five or six pounds pressure to hold against the lower end of the five-inch sleeve bearing. From fifty to one hundred pounds tension was applied to the shaft enclosing tubing. Practically the entire weight of the pumps bowls is carried by the discharge pipe, depending from the pump head. There is no weight carried on the protecting tubing around the shaft.

There is no vent between the upper portion of the enclosing casing and the lower portion; no vent in the enclosing casing; and therefore there is no infringement of Claim 13.

Spiders are screwed on to the discharge pipe at each ten-foot section, which spiders are bored about  $1/32$  of an inch larger than the diameter of the protecting tube. These bearings line up the shaft and keep the alignment of the revolving parts. The weight of the shaft is carried on a special thrust



bearing put in the pump head. The pump is suspended at the top of the well and the entire weight of all the mechanism is supported there.

As for lubrication, the oil is put in at the top and gravitates down inside the shaft casing through the sleeve bearings to the bottom of said casing where part of it is diverted into an oil duct leading to the inside of the hollow runner shaft and part of said oil wastes into the water at that point. The diversion of said oil into the oil duct is accomplished by means of a piston ring designed to be held in place by a light spring with five or six pounds pressure. There is some irregularity of motion in the rotation of the shaft which may lift the ring out of place and if the oil has become thick and sticky, the ring may become stuck above its seat and the oil waste out more rapidly at that point. The oil duct is bored about  $\frac{1}{4}$  of an inch in diameter through the circumference of the solid stub shaft to the center where it turns down and passes out at the lower end into a hollow runner shaft. The hollow runner shaft is screwed on to the stub shaft. It is held in place at the bottom by a stationary stub shaft which is thoroughly lubricated by the oil coming down through the hollow runner shaft.

After lubricating the stub shaft, the oil works up through a similar arrangement to that above described, of spring and piston ring into the water of the well. At first felt was used in connection with the piston rings to keep out the coarse sand, but water went right through. It was not water-tight. Later the felt was abandoned.

About one-half pint of oil is used for a ten-hour run.

There are no thrust bearings used to help the closure at the bottom of the shaft casing or anywhere within said casing. Nor is there any adjustable stuffing box as in the Layne patent.

The defendants' structure differs from the Layne patent on account of the defendants' new means and system for directing and applying the oil and discharging same into the water after it has lubricated the bearings.

For this reason defendants do not infringe the plaintiff's claim 13 here involved, but as I have heretofore found, claim 20 is infringed, if not claim 9 also. See Getty case, *supra*.

This was the condition and structure of the defendants at the time suit was brought and up to January 23, 1920.

#### SUPPLEMENTAL AND CHANGED CONSTRUCTION OF DEFENDANTS' DEVICE AND REPORT UPON CONTEMPT PROCEEDINGS.

At this time defendants adopted different features as to pump mechanism as to lubrication and for closure. They abandoned the combination above mentioned which was apparent in the Layne structure.

There cannot be said to be any difference in the method of alignment used by the defendants in their structure and the method used by Layne. The mechanism in both cases is suspended from the top of the well, but in the defendants' pump by reason of a slight support of the enclosing tubing on the

pump neck there is little tension imposed upon by the enclosing tubing.

The alignment is kept by the use of spiders in the defendants' pump and it is also adopted at intervals in the Layne pump. The use of spiders was a well-known mechanism and it cannot be held that the defendants have necessarily adopted that part of the Layne device for the purpose of creating an alignment and there is no new discovery on their part by the adoption thereof.

With reference to the method of lubrication, however, there was a considerable difference subsequent to January 23d, 1920, between the methods employed by the defendants and by Layne. Layne's method of lubrication was to put the oil in at the top and permit it to descend to each of the shaft bearings and remain stagnant in the shaft casing until ejected from the top, after it had become spent, by air pressure through an air vent. When it was ejected, it was replaced by clean oil from the top again. The oil was confined at the bottom of the tubing by use of a packing or stuffing box.

The defendants, however, after January 23d, 1920, adopted a circulatory system of lubrication. The oil was introduced from the top, passed through a short tube connected to the casing and descended along the casing to the shaft bearings by gravity. Before reaching the extreme lower end of the protecting casing it passed through between a long eight-inch sleeve bearing (which surrounds the upper end of the stub and which extends down into the pump neck), and the outside of the stub shaft. This long sleeve bearing was bored  $1/64$  of an inch

larger than the shaft and from the lower end of the long sleeve bearing the oil passed into a duct in the shaft where there was a passageway and thence out through the bottom of the stub shaft where the unconsumed oil mingled with the waters of the well. This method was different from anything that had ever before been constructed and provided a means of lubrication from the top to the bottom, prevented stagnation in the oil and made it absolutely circulatory at all times that the mechanism was in operation.

The defendants' mechanism is free from any closure device either against the flow of oil outward or the flow of water inward, except the long sleeve bearing. Necessarily the downward pressure of the column balances the upward pressure of the water column. There are no packing boxes in the defendants' structure as in the Layne invention to effect closure, and it is absolutely necessary that there should be nothing to prevent the exit of oil which is a necessary feature of the circulatory system. There is no downward thrust in the defendants' structure due to the weight of the apparatus as the means of closure. One-half pint of oil is plenty for a ten hours' run.

It would appear therefore that defendants accomplished lubrication and closure by means so fundamentally different from Layne's closure in his patent that they cannot be said to be mere mechanical equivalents. The fact that the defendants' structure either in lubrication or closure are not as complete in effect as that of Layne is an important factor but the structures differ so radically that it can-

not be said to be a mere difference in degree.

Layne's closure is effected by physical obstructions such as packing boxes and thrust bearings and by pressure of the oil column while the defendants' closure is effected by the column of water outside the shaft casing against the pressure of the oil inside the casing without the use of physical obstruction. The difference is one of novelty on the part of the defendants and not adopted merely to avoid infringement.

The defendants' structure is suspended from the top of the well but it does not use thrust bearings to help close the bottom of the shaft casing. The differences between the plaintiff's structure and the defendants' structure are with reference to the lubrication and closure and are so important that they should not be held to be mechanical equivalents and not to infringe the enclosed line shaft lubrication enclosure of the Layne patent.

In these features especially do I find that the defendants do not infringe the plaintiff's patent.

On the 27th of April, 1920, an order was entered herein directing that the above-named defendants, and each of them, show cause before this Court why they, and each of them should not *adjudged* in contempt of court for violating the restraining order or injunction heretofore issued in the above-entitled cause. It came on for hearing in open court on Monday, the tenth day of May, 1920, and by stipulation, consent and agreement of counsel for plaintiff and defendants it was ordered that said order to show cause, and the plaintiff's motion accompanying the same, should be referred to the undersigned

as Special Master to hear all the evidence and proof and decide all the issues between the parties upon said order and motion and upon said charge of contempt of court for violating said restraining order or injunction and to make his report to this court separately stating his findings of law, and fact, together with all the evidence introduced before him, which evidence should become a part of said record.

Accordingly being attended by counsel for the respective parties, having heard the evidence produced on their behalf respectively, I find that since the granting of the said restraining order, and on or about the 14th day of April, 1920, that said American Well and Prospecting Company assembled a pump of said American Well and Prospecting Company's at the ranch of W. E. Hart, near Puente, Los Angeles County, California, as described in the affidavits of Mahlon E. Layne and O. P. Woodburn filed in said case, which pump was erected and installed upon the lines of pumps constructed by said American Well and Prospecting Company subsequent to January 23, 1920, last hereinabove described.

I find that it is true that no water, or sand or detritus was in the enclosing casing or in the bearings and that there was no sand or detritus in the inside of said enclosing casing above the pump neck; that upon the erection of said pump there was a large amount of grease inserted in said casing but that it had become worn and was escaping from just below the long brass sleeve which is located in the pump neck. That said long sleeve bearing in said pump is made of brass and was eight inches in

length, but said long sleeve bearing does not effect the entire closing of the pump shaft with the enclosing case from water or sand to detritus from the well, from the discharge pipe and from the pump proper in combination with a lubricant as contained therein or in the same manner set forth in said Layne patent, and does not in fact effect any closure of said pump as it is open and the oil and lubricant are free to move therein without obstruction.

I, therefore, find that said defendants have not constructed said pump at the Hart ranch, or otherwise or at any place, since January 23, 1920, in violation of said restraining order or infringement of the said Layne patent.

I further find that said defendants before abandoning the construction of said original device, as hereinbefore set forth, and before constructing the pump on the Hart ranch, which it was alleged was done in violation of the injunction herein, submitted said device by them constructed since January 23d, 1920, to their attorneys, learned in the law and familiar with such matters, and were advised by them that said device was not in infringement of said patent and not in violation of said injunction; that they did not violate said injunction wilfully or with any attempt to usurp the prerogatives of this court.

As a conclusion therefrom, I find that an order should be made herein discharging said order to show cause and absolving said defendant from violation of said restraining order without costs to either party.

As conclusions from the foregoing, I find that a

decree should be entered herein finding that the defendants prior to January 23, 1920, infringed said patent No. 821,653, and should be restrained from further infringing the same, and that they should account to the plaintiff for the profits which they may have received from that infringement and for such damages as the plaintiff may have suffered by reason thereon and that plaintiff should have recovery of his costs herein. On January 23d, 1920, a motion was made by the defendants for leave to file in said suit a counter-claim against the plaintiff to recover damages against it for the alleged wrongful suing out and prosecuting said restraining order, entered herein as aforesaid. Said motion was then taken under advisement and is now determined. In view of the evidence and what has been found herein as aforesaid, said motion for leave to file said counter-claim is denied and said counter-claim is dismissed for want of equity.

The foregoing completes the findings of fact and of law, both upon the original reference and the order to show cause why the defendants should not be punished for contempt. Appropriate orders should be made in reference to both divisions of this report.

Respectfully submitted,

LYNN HELM,  
Special Master.

Dated July 13, 1920.

[Endorsed]: No. E-42. In the United States District Court, Southern District of California, Southern Division. Layne & Bowler Corporation, Plaintiff, vs. American Well & Prospecting Co.,



Isaac N. Johnston and Frank R. Galbreath, known as King Meh. & Mfg. Co., Defendants. Master's Report. Filed Jul. 14, 1920. Chas. N. Williams, Clerk. By R. S. Zimmerman, Deputy Clerk. Lynn Helm, E. S. Williams, 918 Title Insurance Building, Los Angeles, Cal., Attorneys for ———.

I, Chas. N. Williams, Clerk, United States District Court, for the Southern District of California, do hereby certify the foregoing to be a full, true and correct copy of the original Master's Report filed in my office July 14th, 1920, in the cause entitled: Layne & Bowler Corporation, Plaintiff, vs. American Well & Prospecting Co. et al., Defendants, No. E-42—Equity, Southern Division, as the same remains on file therein.

ATTEST my hand and the seal of said District Court, this 3d day of September, A. D. 1920.

[Seal]

CHAS. N. WILLIAMS,

Clerk.

By P. W. Kerr,

Deputy Clerk.

[Endorsed]: No. E-42—Equity. United States District Court, Southern District of California, Southern Division. Layne & Bowler Corporation, Plaintiff, vs. American Well & Prospecting Company et al., Defendants. Certified Copy Master's Report.

No. 485. U. S. Dist. Court, Nor. Dist. Calif. Deft. Exhibit "S." Filed Sept. 7, 1920. Maling, Clerk.

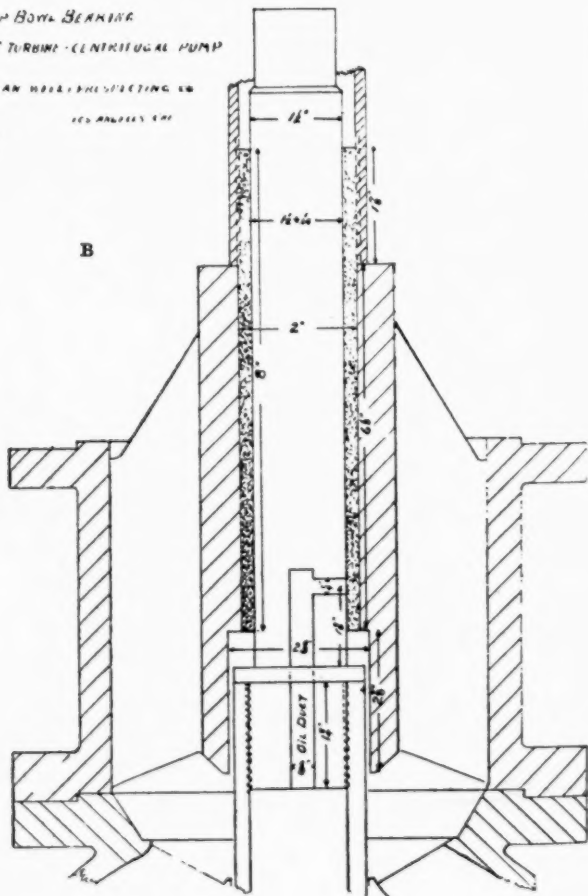
No. 3627. United States Circuit Court of Appeals for the Ninth Circuit. Filed Jan. 6, 1921. F. D. Monckton, Clerk.

1104 Western Well Works, Inc., et al.

Defendants' Exhibit "T" for Identification.

TOP BOWL BEARING  
JOHNSTON 10" TURBINE - CENTRIFUGAL PUMP  
AMERICAN HOSE & SHEET METAL CO.  
105 MADISON AVE.  
JAN 24/27

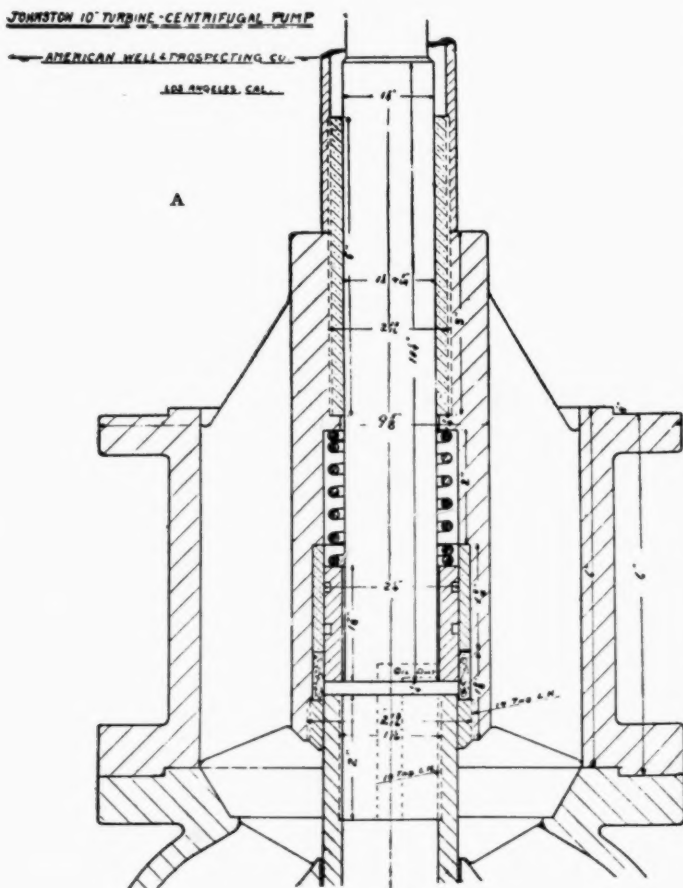
B



[Endorsed]: No. 485. U. S. Dist. Court, Nor. Dist., Calif. Deft. Exhibit "T" for Identification. Filed Sept. 7, 1920. Maling, Clerk.

No. 3627. United States Circuit Court of Appeals for the Ninth Circuit. Filed Jan. 6, 1921. F. D. Monekton, Clerk.

**Defendants' Exhibit "U" for Identification.**



[Endorsed]: No. 485. U. S. Dist. Court, Nor.  
Dist. Calif. Deft. Exhibit "U" for Identification.  
Filed Sept. 7, 1920. Maling, Clerk.

No. 3627. United States Circuit Court of Ap-  
peals for the Ninth Circuit. Filed Jan. 6, 1921.  
F. D. Monekton, Clerk.

**Defendants' Exhibit "W."**

[Endorsed]: No. 485—Eq. U. S. Dist. Court, Nor. Dist. Calif. Deft. Exhibit "W." Filed Sept. 7, 1920. W. B. Maling, Clerk. By Lyle S. Morris, Deputy Clerk.

No. 3627. United States Circuit Court of Appeals for the Ninth Circuit. Filed Jan. 6, 1921. F. D. Monekton, Clerk.

vs. Layne & Bowler Corporation. 1109

S. M. HALSTEAD.  
PUMP MECHANISM.

APPLICATION FILED DEC. 20, 1915.

Patented June 5, 1917.

2 SHEETS—SHEET 1.

1,228,770.

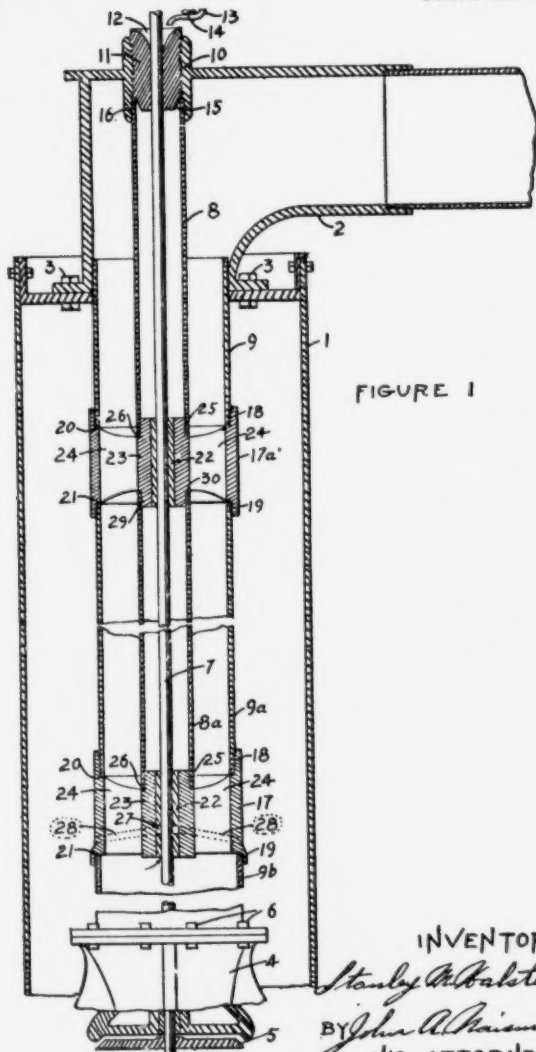


FIGURE 1

INVENTOR

*Stanley M. Halstead*  
BY *John A. Kinsmith*  
HIS ATTORNEY

S. M. HALSTEAD.  
PUMP MECHANISM.

APPLICATION FILED DEC. 20, 1915.

1,228,770.

Patented June 5, 1917.

2 SHEETS—SHEET 2.

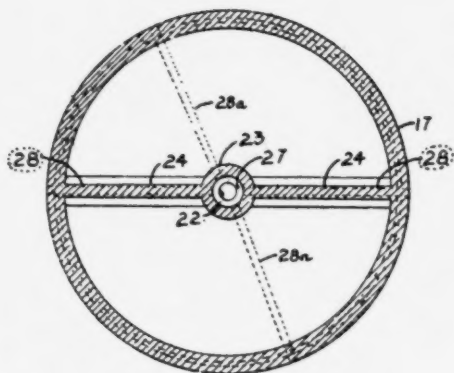


FIGURE 3

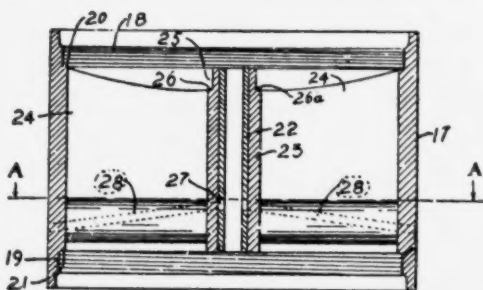


FIGURE 2

INVENTOR

*Stanley A. Halstead*

BY *John A. Harrison*  
HIS ATTORNEY



UNITED STATES PATENT OFFICE.

STANLEY M. HALSTEAD, OF SAN JOSE, CALIFORNIA.

PUMP MECHANISM.

Specification of Letters Patent. Patented June 5, 1917.

Application filed December 20, 1915. Serial No. 67,797.

all whom it may concern:

Be it known that I, STANLEY M. HALSTEAD, a citizen of the United States, and resident of San Jose, in the county of Santa Clara and State of California, have invented certain new and useful Improvements in Pump Mechanism, of which the following is a specification.

My invention relates to pump mechanism, and more particularly to shaft bearings and parts connected thereto. Two of the greatest difficulties involved in the operation of driving a shaft coupled to a pump submerged in a well, are the keeping of the bearings of said shaft properly lubricated and securing a more perfect and rigid alinement of said shaft. It is the object of this invention to overcome the above named difficulties as well as to simplify the construction and operation of the mechanism and to reduce the installation cost by eliminating certain portions rendered unnecessary by my special form of construction. Other objects are to prolong the life of the mechanism, and to provide a simple and effective cooling system for the same.

These objects are obtained by means of the mechanism described and claimed in this specification and illustrated in the accompanying drawings, in which;—

Figure 1 is a section through a well embodying the preferred form of my invention, parts being broken away.

Fig. 2 is a vertical section through the lower bearing.

Fig. 3 is a sectional view on line A—A of Fig. 2.

Similar characters of reference refer to similar parts throughout the several views.

Referring now more particularly to the drawings, 1 indicates the well casing and 2 the discharge head secured to casing 1 by bolts 3. At 4 is indicated a pump bowl secured to discharge casing 9b by bolts 6, the shaft being secured to pump 5 in bowl 4 and driven in any practical manner. Shaft 7 passes through conduits as 8 and 8a, the discharge casing sections being shown at 9, 9a, etc. The uppermost bearing for shaft 7 is located in the discharge head at 10, part 10 being preferably cast integral with the discharge head 2 and threaded interiorly to receive bearing 11. Bearing 11 is provided with a cup shaped top surface as indicated at 12 into which oil is fed from pipe 13

which is connected to a source of supply not shown, and the amount of oil fed is regulated by a valve 14 or by any other suitable regulator. The lower end of bearing 11 is tapered slightly as shown at 15 in order to receive the upper end of conduit 8, said conduit end slipping into part 10 as shown at 16. At any desirable distance above bowl 4 is positioned bearing 17, the same being interiorly threaded at each end as shown at 18 65 and 19 respectively to receive the threaded ends of discharge pipe sections 9a and 9b respectively, shoulders 20 and 21 being made parallel and true so that when the ends of the discharge casings are fitted to said bearings said casings will be in perfect alinement. At 22 is indicated the rabbitted portion of the bearing in the hub 23, said hub 23 being connected to the outer wall of the bearing by webs as 24. The upper edge of hub 75 23 is provided with an annular rabbet as 25, thus forming a seat 26, said rabbet 25 and seat 26 serving to receive one end of a conduit as 8a. At 27 is shown an annular channel cut into, or out of, rabbitt 22 and 80 drained by auxiliary conduits 28 passing through webs 24 to the outside and discharging into the well proper.

The above description covers the special construction of the top and bottom bearings. 85 The intermediate bearings are made similar to the bottom bearing last described, with the exception that they are not provided with the annular channel 27 and auxiliary conduits 28 and are provided with a rabbet 90 as 29 and seat 30 on the lower edge of the hub portion as shown in Fig. 1.

When the parts are being prepared for assembling, the ends of the discharge casing sections are manipulated in a lathe in such a manner as to be threaded exactly the same and to have their ends parallel and true, so that when screwed into the threaded portion of the bearing, as section 9a into bearing 17 at 18, the section will come to a true seat 100 as at 20. By bringing each discharge casing section to an exact and true seat as above described, the successive sections must be in alinement, and being screwed in tight must provide a very rigid and secure discharge casing. Since the hub of each bearing member is rigidly connected to the outer portion to which the discharge casing sections are secured it naturally follows that the shaft 105 passing through the successive bearings must

be held in very rigid alinement, and thus one of the principal objects of my invention is secured.

The distance from the bottom bearing 17 to the pump bowl 4 is such as practical conditions in each instalment may dictate, usually a distance corresponding to the standard length of one discharge casing section which forms the support for said bearing. It is the object of the conduits between the successive bearings to assist in the lubrication of said bearings, therefore it is obvious that no conduits are required below the bottom bearing 17 even though said bearing is positioned only half way between the top bearing and the pump bowl, thus eliminating in every case many feet of conduits.

It is not necessary that the conduit seats be square as shown at 26, for since it is desirable to permit the passage of water at these points said seats may be of any convenient form as, for instance, the seat may slope as indicated at 26a. Neither is it necessary that the auxiliary conduits 28 be formed in webs 24 as they may be pipes fitted as shown in dotted lines at 28a in Fig. 3.

When these parts are properly assembled and fitted as hereinbefore described, I am enabled to lubricate all of the bearings with a very small amount of oil in an emulsified form. As hereinbefore described conduits 8 and 8a do not fit tightly into their respective rabbets, but effect a loose sliding fit, thereby permitting a small amount of water to work its way through into the interior of said conduits at these points, the water thus entering being practically free of sand or grit of any kind because of the filtering action of the small space through which it makes its way. This provision for a small quantity of water in the conduits is made so that when oil is fed into the top bearing at 12 and makes its way through said bearing down the shaft to the second bearing 17a, it mixes with the water at said bearing and is emulsified by the rotary action of shaft 7. This emulsion passes down through the successive bearings until the bottom bearing 17 is reached where it passes out through channel 27 and auxiliary conduits 28 into the well proper.

It will be observed that channel 27 is placed a short distance above the lower end of bearing 17. This is done so that the lubricating emulsion will traverse the greater portion of the bearing before draining away. That portion of the bearing below channel 27 will not be lubricated because the upward pressure of the water being raised will tend to force a small amount of water in the direction of the arrow upward through the bearing until the channel 27 is reached where it will be drained away through auxiliary conduits 28. There being

no provision for filtering the water at this point the bearing below channel 27 will of course be worn by attrition, but the major portion of the bearing will remain true and properly perform its function.

It is of course well known that clear water is an excellent lubricant, but the tendency of the shaft to corrode renders its use objectionable when used alone. The use of oil alone is highly objectionable as it contaminates the water to such a degree as to become a nuisance when fed from the top or bottom, and requires a more or less complicated system of pipes when fed directly to each bearing, besides adding considerably to the expense of operating. I obviate these objectionable features by using an oil emulsion as a lubricant as above described, thereby providing a cheap lubricating medium, preventing corrosion of the shaft, not contaminating the water delivered and, on account of the constant flow of water through the bearings, providing an efficient cooling system for said bearings.

It will be readily seen, of course, that since the conduits are connected to the well proper by channel 27 and auxiliary conduits 28 the water in said conduits will be drained to the level of the water in the well when the pump is in operation, and consequently there will always be a movement of the water into said conduits, down the shaft, through the bearings and out through auxiliary conduits 28. The draining of conduits 8, 8a, etc., in this manner also conduces to economy by obviating the necessity of providing a stuffing-box at the top bearing.

It should be understood that while I have specifically described one embodiment of my invention, many changes may be made therein without departing from the spirit and substance of my invention, as for instance, while I have shown and described my invention in use with a vertical rotary pump, it can be used equally as well with a vertical reciprocating pump.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. A bearing member adapted to engage a shaft and adapted to slidably engage conduits through which said shaft passes and tapped to receive the threaded ends of discharge casing members.

2. A bearing member adapted to engage a shaft and adapted to loosely engage a conduit through which said shaft passes and tapped to engage the threaded ends of discharge casing sections, there being an annular channel formed in the wearing surface of said bearing member and means for providing open communication between said annular channel and the exterior of said bearing member.

3. A bearing member adapted to engage a shaft, said bearing member being supported by a discharge casing section and supporting a discharge casing section and a conduit through which said shaft passes and provided with means whereby open communication is maintained between said conduit and the exterior of said bearing member.

4. A bearing member comprising a hub adapted to engage a shaft and slidably engage the ends of conduits through which said shaft passes, and an outer member supported by said hub and adapted to engage the ends of discharge casing sections.

5. A mechanism of the character described, comprising a shaft, a pump attached to said shaft and submerged in a well, a pump bowl inclosing said pump, a discharge casing extending from said bowl to the top of the well, and a plurality of bearings for said shaft supported by said discharge casing, the lowermost of said bearings being spaced a distance above said pump bowl, and the successive bearings being connected by tubes in such a manner as to form conduits through which said shaft passes and permit a quantity of water to enter said conduits and traverse said bearings when the pump is in operation.

6. A mechanism of the character described, comprising a pump, a shaft attached

thereto, an upper bearing for said shaft adapted to receive a lubricating fluid, a bottom bearing for said shaft adapted to drain away lubricating fluid from the bearings to the well, and alternate and loosely coupled conduits and bearings through which said shaft passes.

7. In combination with a pump having a shaft attached thereto, an upper bearing adapted to receive a lubricating fluid, means for introducing a predetermined quantity of lubricant into said bearing, a bottom bearing adapted to drain away lubricating fluid from said bearings, and alternate and loosely coupled conduits and bearings through which said shaft passes connecting said upper and bottom bearings.

8. In a pump mechanism for wells, the combination with a pump having a shaft attached thereto and an inclosure therefor, of a discharge casing extending from said inclosure to the top of the well and supporting a bearing for said shaft, said bearing forming the lower discharge end of a series of loosely coupled conduits and bearings through which said shaft passes.

In testimony whereof I have hereunto affixed my signature this 9th day of December, 1915.

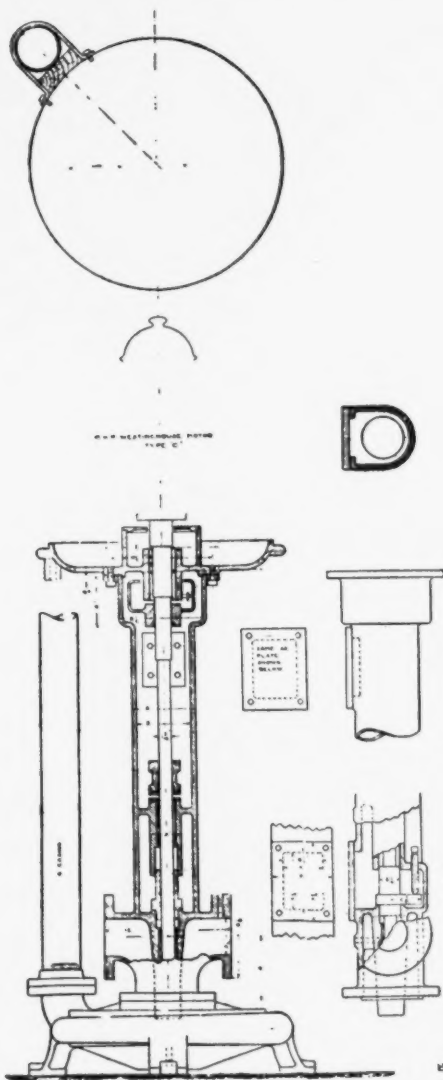
STANLEY M. HALSTEAD.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."

1114 *Western Well Works, Inc., et al.*

No. 485—Eq.

**Blue-print Attached to Deposition of Franklin A.  
Jackson and R. C. Robb.**



3 1/2 INCH CENT PUMP  
BYRON JACKSON MACHINE WORKS  
DRAWN BY J. C. ROBB  
CHECKED BY F. A. JACKSON  
DATE 10-10-10

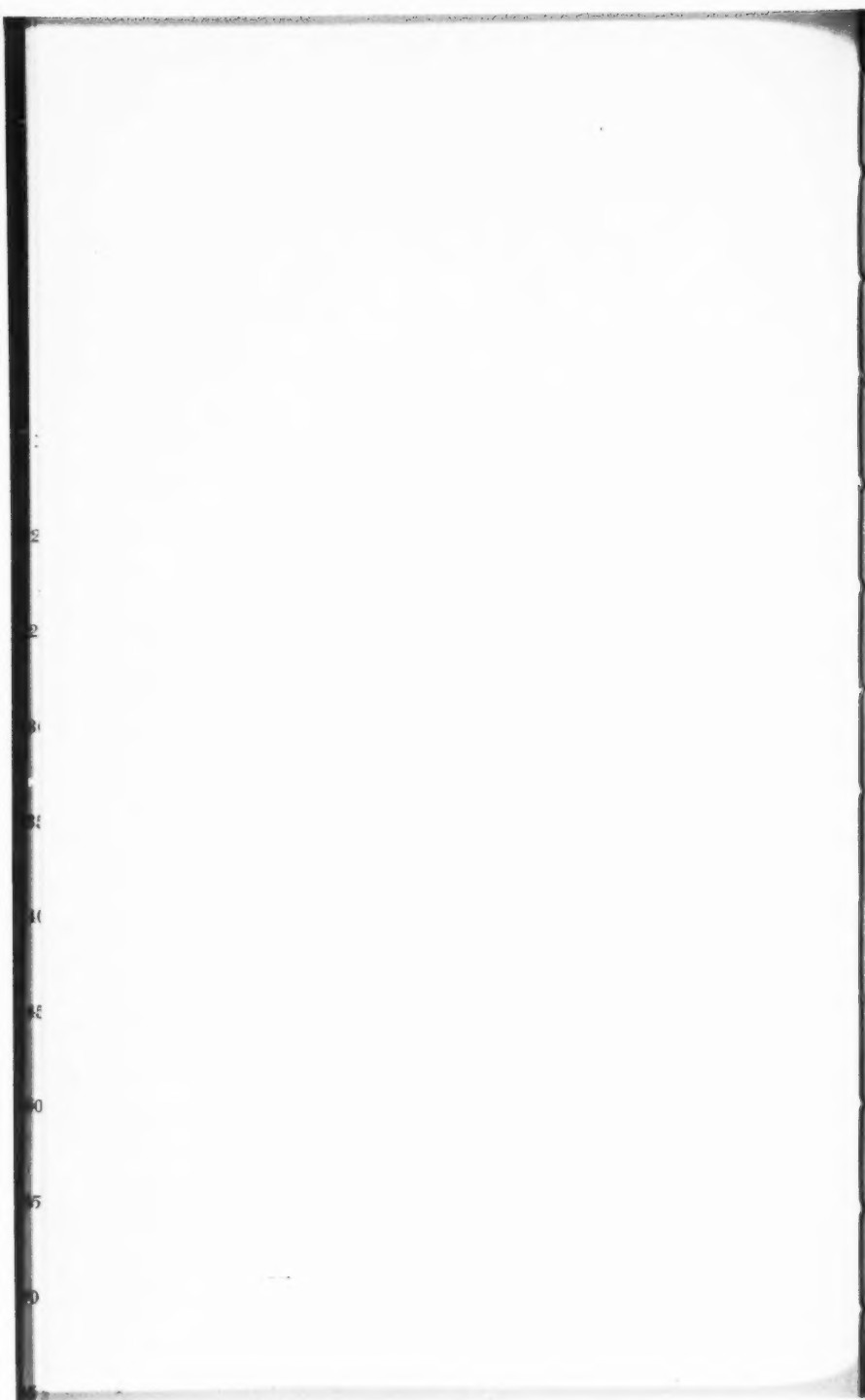
I, Chas. N. Williams, Clerk of the United States District Court for the Southern District of California, do hereby certify the foregoing to be a full, true and correct copy of the Defendants' Exhibit No. 2 in the case entitled Layne & Bowler Corporation, Complainant, versus American Well & Prospecting Co., et al., Defendants, in Equity—No. 42, filed in the office of Lynn Helm, Special Master, on March 1st, 1920, and filed in my office on July 14th, 192 , as the same remains on file and record therein.

[Seal] CHAS. N. WILLIAMS,  
Clerk, United States District Court, Southern District of California, Southern Division, this 23d day of August, A. D. 1920. By R. S. Zimmerman.

[Endorsed]: Deft. #2. U. S. District Court, Southern District of California. Before Hon. Lynn Helm, Special Master. Layne & Bowler Corporation, Complainant, vs. American Well & Prospecting Co. et al., Defendants. In Equity—No. E-42. Defts. Ex. #2. Filed Mar. 1, 1920. Filed July 14, 1920. Chas. N. Williams, Clerk. By R. S. Zimmerman, Deputy Clerk.

No. 3627. United States Circuit Court of Appeals for the Ninth Circuit. Filed Jan. 6, 1921. F. D. Monckton, Clerk.

[Endorsed]: Printed Transcript of Record. Filed January 29, 1921. F. D. Monckton, Clerk.



**No. 3627**

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**United States  
Circuit Court of Appeals**

**For the Ninth Circuit.**

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**WESTERN WELL WORKS, INCORPORATED,**  
a Corporation, **ROTARY DRILLING &  
DEVELOPMENT COMPANY,** a Corpora-  
tion, **STANLEY M. HALSTEAD, P. E.**  
**VAUGHAN and ALLEN W. ROSS,**  
Appellants,

vs.

**LAYNE & BOWLER CORPORATION,** a Corpo-  
ration,  
Appellee.

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**Upon Appeal from the Southern Division of the  
United States District Court for the  
Northern District of California,  
Second Division.**

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**PROCEEDINGS HAD IN THE  
UNITED STATES CIRCUIT COURT OF APPEALS  
FOR THE NINTH CIRCUIT.**

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At a stated term to wit, the October Term, A. D. 1920, of the United States Circuit Court of Appeals for the Ninth Circuit, held in the courtroom thereof, in the City and County of San Francisco, in the State of California, on Tuesday, the first day of March, in the year of our Lord one thousand nine hundred and twenty-one. Present: Honorable WILLIAM B. GILBERT, Senior Circuit Judge, Presiding; Honorable WILLIAM W. MORROW, Circuit Judge; Honorable CHARLES E. WOLVERTON, District Judge.

No. 3627.

WESTERN WELL WORKS, INCORPORATED,  
a Corporation, et al.,

Appellants,

vs.

LAYNE & BOWLER CORPORATION, a Corporation,

Appellee.

**Order of Submission.**

ORDERED appeal in the above-entitled cause argued by Mr. Charles E. Townsend, counsel for the appellants, and by Mr. Frederick S. Lyon, counsel for the appellee, and by Mr. Charles C. Montgomery, as *amicus curiae*, and submitted to the Court for consideration and decision, with leave to counsel for the respective parties to file further briefs.



At a stated term to wit, the October Term, A. D. 1921, of the United States Circuit Court of Appeals for the Ninth Circuit, held in the courtroom thereof, in the City and County of San Francisco, in the State of California, on Monday, the seventeenth day of October, in the year of our Lord one thousand, nine hundred and twenty-one. Present: Honorable WILLIAM B. GILBERT, Senior Circuit Judge, Presiding; Honorable ERSKINE M. ROSS, Circuit Judge; Honorable WILLIAM H. HUNT, Circuit Judge.

No. 3627.

WESTERN WELL WORKS, INC., a Corporation,  
ROTARY DRILLING & DEVELOPMENT  
COMPANY, a Corporation, STENLEY M.  
HALSTEAD, P. E. VAUGHN and ALLEN  
W. ROSS,

Appellants,

vs.

LAYNE & BOWLER CORPORATION,

Appellee.

**Order Directing Filing of Opinion and Dissenting  
Opinion and Filing and Recording of Decree.**

By direction of the Honorable William B. Gilbert and William W. Morrow, Circuit Judges, and the Honorable Charles E. Wolverton, District Judge, before whom the cause was heard, ORDERED that the typewritten opinion this day

rendered by this Court in the above-entitled cause be forthwith filed by the clerk, and that an order be filed, and recorded in the minutes of this court, in said cause in accordance with said opinion.

By direction of the Honorable William B. Gilbert, Circuit Judge, ORDERED that the dissenting opinion written by him, and this day rendered in said cause, be forthwith filed by the clerk.

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In the United States Circuit Court of Appeals for  
the Ninth Circuit.

No. 3627.

WESTERN WELL WORKS, INC., a Corporation,  
ROTARY DRILLING & DEVELOPMENT  
COMPANY, a Corporation, STANLEY M.  
HALSTEAD, P. E. VAUGHN and ALLEN  
W. ROSS,

Defendants and Appellants,

vs.

LAYNE & BOWLER CORPORATION,  
Plaintiff and Appellee.

**Opinion U. S. Circuit Court of Appeals.**

Upon Appeal from the Southern Division of the  
United States District Court for the Northern  
District of California, Second Division.

IN EQUITY: Suit brought by the Layne & Bowler Corporation against the Western Well Works, Inc., Rotary Drilling & Development

Company, a Corporation, Stanley M. Halstead, P. E. Vaughn, and Allen W. Ross. Decree for the Plaintiff. Defendant appeals.

This suit was brought for infringement of Claims 9, 13, and 20 of letters patent No. 821,653, issued May 29, 1906, on an application filed April 28, 1903, to Mahlon E. Layne for "Well Mechanism," the plaintiff and appellee being the assignee of said Layne.

CHAS. E. TOWNSEND, WM. A. LOFTUS, Attorneys for Appellants.

WILLIAM K. WHITE, FREDERICK S. LYON, Attorneys for Appellee.

RAYMOND I. BLAKESLEE, CHARLES C. MONTGOMERY, Attorneys for *Amici Curiae*.

Before GILBERT and MORROW, Circuit Judges, and WOLVERTON, District Judge.

MORROW, Circuit Judge:

This is an appeal by the defendants from the interlocutory decree of the District Court of the United States for the Northern District of California, Second Division, entered December 31, 1920. The validity of Patent No. 821,653 for "Well Mechanism" and the infringement of claims 9, 13, and 20 were in issue. The decree sustains the validity of the claims and holds that the defendants had infringed said claims, and directs a permanent injunction to issue against the defendants, enjoining and restraining them from making, using, selling, or causing to be made, used, or sold, any

well mechanism embodying or containing the invention described in said letters patent and claimed in and by said claims 9, 13, and 20.

In the application for the patent in suit, Layne declared that he had "invented certain new and useful improvements in Well Mechanism," and he specifies that his "invention relates to the apparatus used for drawing water from driven or Artesian wells, and particularly to the means for adjusting a pump therein."

The objects of the invention, he declares, "are, to provide means by which the piping and the pump may be all assembled in proper shape before inserting it into the well; to provide means by which a pump may be placed in any desired position in a well, centered, raised, or lowered and fixed in position by manipulating from the outside entirely; to provide means for adjusting the length of the piping leading from the pump to the surface at will and to lower the pump from time to time without taking it out of the well; to provide improved means for centering and fixing the pump in proper position in the well casing; to provide improved means for manipulating the packing of the pump shaft, and proper adjustment of the pump in place by means at the surface of the ground; to provide for the proper action of a pump without stopping up the well so that the water may be either flowed into or pumped out of the same at pleasure; to provide a superior mounting for a centrifugal pump in the well, manipulated from the surface of the ground; to provide an extensible pump shaft

separately supported at intervals along its length; to provide an automatic centering device for the pump in the well; to provide for mounting the pump and the shaft in a closed casing which is open to operate from the top; to obviate the necessity of making large wells for descending into them in order to arrange the pump, and to generally improve and cheapen the apparatus used for the above purposes."

The specification informs the public of the objects to be accomplished by the improvements in the Well Mechanism invented by the applicant, and for the purpose of claiming all his improvements in the Mechanism as inventions, he makes twenty-two claims. Six of these claims, namely, those numbered 1, 2, 8, 11, 16, and 19, assemble certain specified elements in each claim as forming in such claim a unit of invention in the Mechanism. The remaining claims, namely, 3, 4, 5, 6, 7, 9, 10, 12, 13, 14, 15, 17, 18, 20, 21, and 22, assemble certain specified elements in combination in each claim as also forming in such claim a unit of invention in the mechanism. The various elements in all these claims relate to the one principal invention of a "Well Mechanism." In that relation they are all designed to co-operate in co-operating towards the common end of being employed in an apparatus to be used for drawing clean water from a driven or Artesian well. The patent comes within the rule stated by Mr. Justice Story in *Wyeth vs. Stone*, 1st Story 271,292, 30 Fed. Cas. 18,107, page 723, where it was held that a patent for several

machines, each being a distinct and independent invention, is valid where they have a common purpose and are auxiliary to the same common end. It is not necessary, in order to maintain a suit upon such a patent, says the Court, "that there should be a violation of the patent throughout. It is sufficient if any one of the invented machines or improvements is wrongfully used; for that, *pro tanto*," violates the patent."

To the same effect is *Emerson vs. Hogg*, 2 Blatch. 1, 8; 8 Fed. Cas. 4,440, p. 613; *Hogg vs. Emerson*, 6 How. 437; *Hogg vs. Emerson*, 11 How. 587.

This rule applies to the invention described in a separate claim as well as to the invention described in the patent as a whole.

The claims charged to have been infringed in this case are 9, 13, and 20 of the combination class. For convenience and accuracy of reference we separate the elements of these claims into clauses, as follows:

**CLAIM 9.**

1. In a well mechanism
2. the combination with a pump casing, of
3. a rotary pump of
4. a jointed pump shaft and
5. a closed casing surrounding the pump shaft
6. from the pump to the top of the well.

**CLAIM 13.**

1. The combination with
2. a pump and its

3. actuating shaft of
4. a sectional casing therefor
5. provided at each end of each section with
6. a fixed block with
7. bearings for the shaft,
8. the casing being closed at the top and provided with
9. an air vent.

CLAIM 20.

1. The combination of
2. a well casing,
3. a rotary pump therein, and
4. a line shaft for the pump
5. entirely closed off from the water in the well.

Referring to the specification and assemblage of the parts of the mechanism in preferred forms illustrated in the drawings accompanying the application for the patent, we find that the "rotary pump" mentioned in clause 3 of claim 9, the "pump" mentioned in clause 2 of claim 13, and the "rotary pump" mentioned in clause 3 of claim 20, have the same identical function, and the approved form of the "pump" used by the inventor is a centrifugal pump. We find also that the "jointed pump shaft" mentioned in clause 4 of claim 9; the "actuating shaft" mentioned in clause 3 of claim 13, and the "line shaft" mentioned in clause 4 of claim 20, perform the same function, the preferred form of which is declared by the specification to be made in sections "which are attached together by means of sliding keys so as to allow of some vertical play with relation to each other."

We find also that the combination with a "pump casing" mentioned in clause 2 of claim 9, the "closed casing surrounding the pump shaft" mentioned in clause 5 of claim 9, the "sectional casing" mentioned in clause 4 of claim 13, the "casing being closed at the top" in clause 8 of claim 13, and the "well casing" of clause 2, claim 20, by which the pump is "entirely closed off from the water in the well" mentioned in the last two words of clause 4 and in clause 5 of claim 20, perform the same function, the preferred form of which is declared by the specification to be made in joints of any desired length, with stuffing box at surface of ground at top of pump, so that by the use of the packing-boxes an air-tight chamber can be maintained.

In clause 8 of claim 13 "the casing being closed at the top" is followed by the addition in clause 9, "and provided with an air vent," and the "sectional casing" of clause 4 of claim 13, is provided in clause 5 "at each end of each section" with "a fixed block" in clause 6, and with "bearings for the shaft" in clause 7.

This analysis discloses that the essential elements of these three claims consist of (1) a pump, and (2), a pump shaft entirely closed off from the water in the well by (3) a sectional pump casing provided at the end of each section with (4) a fixed block with (5) bearings for the shaft, and (6) the casing being closed at the top and provided with an air vent.

One of the problems for the inventor of this character of pump was to protect the bearings from



the sand and water carried up from the well bottom. Another problem was to provide a method for efficiently lubricating the bearings of the pump shaft while it was in operation. No one could descend into the driven well for that purpose, and while oil might be carried to the bearings in small pipes, it was also a problem to keep the used and spent oil from escaping into the water conduit.

To meet these problems the specification describes the closed casing as designed to keep the water out and retain clean fluid for the efficient lubrication of the shaft bearings.

It is contended by the plaintiff that this closed shaft casing has three functions, namely: (1) Protection of the shaft and its bearings from the water and sand pumped to the surface; (2) lubrication of the shaft bearings, and (3) alignment of the shaft.

In the specification we find that one of the functions claimed for this casing is to protect the shaft and its bearings from the water and sand pumped to the surface. Another function claimed is to enclose the means provided for the lubrication of the shaft bearings, but further than this the specification does not go.

In claim 18 the combination includes "a pump and means for suspending it from the top of the well." The plaintiff claims that by this suspension the pump hangs pendent from the top of the well like a plumb bob in the well cavity, and that the shaft casing will also so hang and thus hold in alignment the shaft bearings mounted within the

casing, and thereby maintain the shaft in alignment. But we do not find any claim for this suspended structure either in claim 9, 13, or 20, and there is no charge that claim 18 has been infringed.

There is a device mentioned in claim 7 of a combination with a well casing and a pump, a series of wedges suspended by rods from the top of the well for operating the same to wedge the pump casing against the well casing. In claim 8 it is said that these wedges are mounted upon toggle links. It is claimed that this device enters into the mechanism of the shaft casing and has also the function of alignment of the shaft, but there is no charge that either claim 7 or claim 8 has been infringed by the defendants, and it appears from the testimony that this device has been abandoned by the plaintiff and is no longer a part of the mechanism in actual use.

M. E. Layne, the patentee, was a witness for the plaintiff in this case. He was asked on cross-examination if he had ever used the wedges for the function specified in the patent or at all. His answer was: "We have never used the wedges." He was asked concerning the use of the toggles connecting with the wedges, or the parts represented by the rods or links connecting with the toggles, or the rods or links connecting with the wedges, and his reply was that none of them had ever been used. This testimony was given September 2d, 1920. The patent was issued to Mr. Layne May 29, 1906.

It seems clear to us that the alignment is not a function of the shaft casing, but is a function of the means used for suspending the apparatus from the top of the well, combined with the law of gravity. This means for suspending the mechanism is to operate on the shaft casing and not the shaft casing upon the means of suspension, and this suspending device for alignment provided for in claim 18 is no part of this controversy. In other words, we are of the opinion that alignment is not a function of any of the elements of either of the claims under consideration.

In *Wilson & Willard Mfg. Co. vs. Union Tool Co. et al.*, 249 Fed. 729, 734, this Court held "that the patentee is limited to his claims, and the patent is no broader than the claims, and, if the language of the claims in the patent is clear and distinct, the patentee is bound by the language he has employed." Citing *Keystone Bridge Co. vs. Phoenix Iron Co.*, 95 U. S. 274, where the Supreme Court of the United States say, on page 278:

"But the Courts have no right to enlarge a patent beyond the scope of its claim as allowed by the Patent Office. \* \* \* When the terms of a claim in a patent are clear and distinct (as they always should be), the patentee, in a suit brought on the patent is bound by it. *Merrill vs. Yeomans*, 94 U. S. 568. He can claim nothing beyond it. But the defendant may at all times, under proper pleadings, resort to prior use and the general history of the art to assail the validity of a patent or to

restrain its construction. The door is then opened to the plaintiff to resort to the same kind of evidence in rebuttal; but he can never go beyond his claim. As patents are procured *ex parte*, the public is not bound by them, but the patentees are. And the latter cannot show that their invention is broader than the terms of their claim; or, if broader, they must be held to have surrendered the surplus to the public."

We have placed some emphasis upon the fact that all the claims in this patent relate to one principal operative invention of a well mechanism, and in that relation they all in a more or less direct and practical way were designed to co-operate and supplement each other to the common intent and purpose of being employed in an operating pump apparatus for a driven or artesian well, but when we turn to the analysis of the claims in suit, we find that the essential elements claimed to have been infringed are limited and narrow and relate only to combinations of a rotary pump with an actuating shaft entirely closed off from the water in the well by the casing surrounding the pump shaft.

This patent has been before the Circuit Court of Appeals in the Fifth Circuit, on the question of the validity of the patent and the infringement of certain of its claims. In *El Campo Mach. Co. vs. Layne*, 195 Fed. 83, it was held that the patent was valid and claim 13 infringed. In *Van Ness vs. Layne*, 213 Fed. 804, the patent was held valid and claim 20 infringed. In that case the Court sus-

tained the claim of the plaintiff that the protecting casing had three functions, namely: (1) To exclude water and detritus from the shaft and its bearings; (2) to provide a means of lubricating the bearings of each section of the shaft from the top of the well without removing the apparatus from it; and (3) to align the bearings and the shaft so as to prevent lateral displacement in the well and keep the shaft in a vertical position. But the Court was not very confident that the protective casing as set out in the specification contained novelty enough to constitute invention. The fact, however, that there was for some time an unfilled want for some such apparatus as that disclosed by the patent, in the deep well irrigating industry, persuaded the Court that the idea involved invention, though theoretically its novelty and patentability might admit of doubt. With respect to the third function of the shaft casing in aligning the bearings and pump shaft so as to keep the latter in a vertical position in the well, the Court was of the opinion that in the absence of intermediate support the tendency of the shaft, if suspended only from the top, would be to swing laterally in the well and so get out of alignment. The Court found that this tendency is corrected by taking advantage of the downward pressure of the shaft due to gravity, in connection with the intermediate bearings through which the shaft passes. The Court here refers to the bearings for the shaft mentioned in claim 13, but the Court found that the defendant's pump in that case infringed the closed pump casing only as to protection and lubrication.

With respect to alignment the defendant claimed that his pump was suspended from the top bearing exclusively, and that the lower bearing in his pump performed no function after the casing was fixed in position in the well, and that the intermediate bearings were functionally different from those of the patent in suit. The Court appears to have sustained the defendant's contention for it refused to find that claim 13 had been infringed, finding infringement only with respect to claim 20.

In *Getty vs. Layne*, 262 Fed. 141, the Court followed its decisions in the previous cases, determining the question of the validity of the patent in favor of the plaintiff, but the Court held that the patent was not entitled to the wide range of equivalents of a pioneer patent. With respect to claim 20 and the function of the closed casing, the Court held that the defendant's pump in that case could not be held to infringe the means that Layne used to keep the shaft properly aligned, since that was accomplished by suspending the mechanism from the top of the well, while the defendant's pump mechanism received its support by resting on the bottom of the well.

Our conclusion is that the shaft casing has only two functions: (1) To protect the shaft and its bearings from the water and sand pumped to the surface, and (2), to enclose the means provided for lubrication of the shaft bearings. The function of alignment is therefore dismissed from further consideration.

With respect to the shaft casing protecting the

shaft from the ingress of water, claim 20 provides that the line shaft shall be entirely closed off from the water. In the specification the inventor declares:

“I consider it of great advantage also to arrange the pump shaft in a closed casing with stuffing box at surface of ground at top of pump, so that by the use of the packing-boxes an air-tight chamber can be maintained, and water kept out of the casing \* \* \* , or kept filled with clean liquid, if desired, thereby providing an efficient lubricating system for all bearings of the pump.”

There is a pipe or tubular shaft mentioned in the specification which has for one of its purposes a convenient means for forcing the liquid out of the pump shaft casing by forcing air in at the top of the casing. The function of this tubular shaft is further explained by the statement that by forcing air in at the top of the casing by means of a pipe located at that point, the liquid can be forced down into the bottom of the casing, and by means of a small opening at the bottom of the tubular shaft the fluid can be forced out at the top through a pipe outlet and thus keep the casing clear in order to leave the bearings clean therein and not interfere with the working of the pump; or, it is further stated that “this operation may be reversed.” This specification clearly calls for an air tight casing as provided in the other specification previously referred to.

In *Getty vs. Layne*, 262 Fed. 141, the Court on

page 143, in discussing lubrication referred to the closed casing as causing a stagnation of oil in the bearings. The Court said:

“Layne’s method of lubrication was to put the oil in at the top and to permit it to descend to each of the bearings, and remain stagnant within the shaft casing until ejected from the top after it had become spent by air pressure through an air vent. When it was ejected, it was replaced by clean oil from the top again. On the other hand, the oil was confined at the bottom of the well by use of a packing or stuffing box. Getty adopted a circulatory system of lubrication. By it the oil was introduced from the top, and descended to the lower bearings by gravity. However, at the bottom there was only a partial obstruction to its exit, presented by a long sleeve bearing. Its passage out from the shaft casing was automatic and continuous, so that there was a constant and free flow of lubricant from the top of the line shaft, throughout its length, and out through its bottom. This method was claimed to be necessary to Getty’s device, because wear on the upper bearing required a continuous supply of fresh oil for its proper lubrication. These functional differences between the stagnant and circulatory systems of lubrication prevent their being considered as merely mechanical equivalents.”



The difference between the Layne patent and the Getty mechanism, as it appears in *Getty vs. Layne, supra*, is essentially the difference between the Layne patent and the defendants' mechanism in this case. In the Layne patent the shaft casing is entirely closed, or that is the invention claimed in claim 20 and is necessarily the operative device of that claim and of claims 9 and 13, and by this device the oil becomes stagnant in the bearings and is blown out when sufficiently used or spent, while the defendants' shaft is not entirely closed but permits the oil to circulate down through the bearings and out at the bottom while the pump is in operation.

We are of the opinion that there is invention in the entirely closed casing of the Layne patent as claimed in claims 9, 13, and 20, particularly claim 20, functioning as it does in complete protection to the line shaft from the ingress of water and sand and in protecting the means for lubrication.

The next question is that of infringement. Have the defendants infringed claims 9, 13, and 20 of the plaintiff as thus construed and limited?

The defendants in their answer deny infringement of plaintiff's patent and allege that the well mechanism charged by the plaintiff as an infringement of the patent in this case, was manufactured in accordance with and under the protection of letters patent No. 1,228,770, issued to Stanley M. Halstead, June 5, 1917.

In *Ransome vs. Hyatt*, 69 Fed. 148, this Court held that the issuance of a later patent was *prima facie* a presumption of a patentable difference between it and an earlier patent, following the decision of the Supreme Court in *Miller vs. Eagle Mfg. Co.*, 151 U. S. 186, 208; *Boyd vs. Janesville Hay Tool Co.*, 158 U. S. 260, 261. It is also a rule of law that infringement being denied, the burden of proof is upon the plaintiff to establish the charge. *Fuller vs. Gentzger*, 94 U. S. 299, 305; *Bates vs. Coe*, 98 U. S. 31, 49. We start then, with a presumption in favor of the defendants' apparatus under the Halstead patent, and against the alleged infringement, and the burden of proof upon the plaintiff to establish infringement.

The plaintiff contends that there is no substantial difference between the two mechanisms; that defendants' mechanism, as installed, accomplishes the same result as the plaintiff's by substantially the same means, operating in substantially the same way. The court below was of that opinion. The controversy requires a careful examination of the defendants' apparatus in performing the function of protection to the shaft and in the lubrication of the bearings.

In the application for the Halstead patent the inventor stated that one of the objects of the invention was to keep the bearings of the pump shaft properly lubricated. The means for such lubrication is set forth in the specifications. It will be seen that the means involves also the method

of protection, or lack of protection, to the shaft bearings. The specification is as follows:

“When these parts are properly assembled and fitted \* \* \*, I am enabled to lubricate all of the bearings with a very small amount of oil in an emulsified form. \* \* \* conduits \* \* \* do not fit tightly into their respective rabbets, but effect a loose sliding fit, thereby permitting a small amount of water to work its way through into the interior of said conduits at these points, the water thus entering being practically free of sand or grit of any kind because of the filtering action of the small space through which it makes its way. This provision for a small quantity of water in the conduits is made so that when oil is fed into the top bearing \* \* \* and makes it way through said bearing down the shaft to the second bearing \* \* \*, it mixes with the water at said bearing and is emulsified by the rotary action of the shaft \* \* \*. This emulsion passes down through the successive bearings until the bottom bearing \* \* \* is reached where it passes out through channel \* \* \* and auxilliary conduits into the well proper. \* \* \*

“It is of course well known that clear water is an excellent lubricant, but the tendency of the shaft to corrode renders its use objectionable when used alone. The use of oil alone is highly objectionable as it contaminates the water to such a degree as to become a nuisance

when fed from the top or bottom, and requires a more or less complicated system of pipes when fed directly to each bearing, besides adding considerably to the expense of operating. I obviate these objectionable features by using an oil emulsion as a lubricant as above described, thereby providing a cheap lubricating medium, preventing corrosion of the shaft, not contaminating the water delivered and, on account of the constant flow of water through the bearings, providing an efficient cooling system for said bearings."

We have not had the opportunity of seeing the plaintiff's pump at work, nor that of the defendants, but we have carefully examined and analyzed the specifications and claims of both patents and have endeavored to understand their mechanisms and the methods of their operation, by the aid of the expert testimony. The fact remains, however, that we must depend largely upon the facts as related by the witnesses concerning the actual working of these pumps.

E. P. Lesley, a professor of mechanical engineering at Stanford University, was called as a witness for the defendants at the trial. He testified that he had been familiar with the defendants' pump for about two years. In the past year he had been retained by them in an advisory capacity and he had watched operations in their shop; had examined their pump and had superintended the installation of one pump at Stanford University; had tested

the pumps manufactured by the Western Well Works, making observations of the various component parts. Referring to the model of the pump in evidence, he identified it as representing substantially the Halstead patent. He explained the operation of the model as follows:

“In operation, this pump is driven from the top, either by a belt connection or a direct connecting motor, and the runner is rotated; the centrifugal action of the runner drives the water out in the passage of the discharge column, and it is delivered at the surface of the ground, or above the surface, as may be desired. The particular feature of this pump which may need further explanation is the lubricating system. The top, what has been called the top tube bearing No. 11 is provided with holes that are adapted to receive an oil pipe, to which is attached a drip feed oil cup. Oil is fed into a small receptacle, which is channeled in the upper end of the tube bearing member, No. 11, and as the shaft is rotated it is fed and moved by gravity down the shaft enclosing casing, No. 8, until it reaches a point near the top of the pump, where it may meet, or where it meets a recess that is cored in the part No. 17, in the bearing part of No. 17; here are provided two drain pipes; these are made in this side installation of quarter-inch pipe that is inserted in the mold before casting. These drain pipes are open to the well without the discharge casing, so that lubricant fed and moving by gravity, or fed by other means down the

shaft-enclosing casing, runs out into the well at this point."

The witness was asked if he had made any tests to satisfy himself that the mode of operation he had described was correct. He replied that he had made a number of tests as to the operation of the defendants' pump with respect to lubrication. The tests were made after the commencement of the suit. One of the tests was of a pump installed by the defendant The Western Well Works Corporation, at the farm of E. W. Connant near San Jose, California. The evidence was introduced for the purpose of showing that there was a leakage of water through the line joints of the conduit or shaft casing as stated in the specification of the Halstead patent. It would not be practicable to refer to these tests in detail. They were not satisfactory to the Court below and were not accepted for the purpose of drawing inferences therefrom as the opinion of an expert, but it was held that such inferences would be drawn by the Court. The evidence did, however, tend to prove that some water passed through the conduit or shaft casing at the tube joints to the interior shaft. But there was testimony, on the other hand, tending to show that the connections of the shaft casing were so shaped as to be made tight, and that white lead was used on the joints and hard grease introduced into the interior of the casing so that no water of any amount could pass into the interior of the shaft casing. We think the preponderance of the testimony tended to establish that fact and we concur

with the Court below upon that question, but the controlling question still remains to be determined. Does the lubricating oil introduced into the defendants' shaft casing pass down through the bearings, and after being used and spent, finally pass out at the bottom of the shaft into the well proper through a channel or auxilliary conduit constructed for that purpose? If it does, then it is not the same mechanical device for lubrication claimed and specified in the plaintiff's patent. The plaintiff's device does not have any outlet for the used and spent oil to pass out into the well, and as we understand the mechanical construction of plaintiff's pump, it was devised, in part at least, for the specific purpose of avoiding that objection.

That this objection was deemed serious at that time appears from the testimony relating to the Byron Jackson pump set up in the defendants' answer as an anticipation of the Layne Mechanism. We did not discuss that feature of the case when we were considering the elements of the Layne patent, for the reason that while the Jackson pump appeared to be earlier in its conception in point of time, we did not deem it an anticipation in the element of the line shaft for the pump being entirely closed off from the water in the well, as claimed in claim 20 of the Layne patent. The testimony relating to this feature of the Jackson pump mechanism is found in the testimony of Daniel W. Mead, a graduate of Cornell University, a civil engineer by profession, and a professor of hydraulic and sanitary engineering at the University

of Wisconsin. He was employed to develop the water supply for the city of Rockford, Illinois. In that connection he came to San Francisco to interview various manufacturers of centrifugal pumping machines and met among others Byron Jackson of the Byron Jackson Machinery Company, who was engaged in the manufacture of centrifugal pumps. With a representative of that company Professor Mead visited pumping plants in the Sacramento Valley and in San Jose, California. He entered into a contract for the furnishing of three pumps for the City of Rockford, Illinois, to be operated 85 feet below the surface in a shaft 15 feet in diameter. The pumps were furnished and worked successfully. He was employed to develop a great many deep wells, which he did, using the Byron Jackson centrifugal pump, in bored wells of from 8 to 15 inches in diameter. Among others, one for the Pabst Brewing Company at Milwaukee, Wisconsin. This pump was installed in 1903, and raised the water about 200 feet in a bored well 15 inches in diameter. The correspondence between Professor Mead and Byron Jackson Machine Works relating to this pump for the Pabst Brewing Company, is in the record, from which it appears that Jackson was asked for the designs for a centrifugal pump for a well of the specified dimensions. Jackson replied under date of February 17, 1902, that he could design a pump for a 16 inch well to be placed 150 feet below the surface, to discharge directly into the center of the shaft running through the pipes, thus to be



coupled up and hung in the well by the pipe, having no other frame work. "But the difficulty in this problem," he said, "is oiling the shafting and friction of couplings in water." After some correspondence Professor Mead came to San Francisco and saw Mr. Jackson upon the subject of pumps and their construction.

In the correspondence and discussion that followed between Mead and Jackson, the witness said that he, himself, did not appreciate the necessity of an inner pipe and raised the objection that it added to the expense and inquired why it was used. Jackson called the attention of the witness to the fact that in deep wells frequently more or less sand is discharged and that the sand coming up in the water is apt to get in the bearings and destroy them. Another point he made was that water lubrication was not satisfactory and that the bearings should be lubricated with oil; that the bearings of the shaft were to be located inside the central pipe so that they could receive oil from the surface and be free from the action of either standing water or water discharged by the pump, and the bearing plates were also to act as a separator between the outer pipe and the inner pipe, and to give together with the pipes a continuous connection from the drive head above to the pumps below.

Under date of April 20, 1903, the Pabst Brewing Co. submitted to Byron Jackson the form of agreement for the construction of a centrifugal pump for a 15 inch well 200 feet deep, to be delivered

within sixty days. The agreement contains specifications for the pump, among others: "Bearings approximately every ten (10) feet and suitable means for providing for oiling the same, which will allow no mixture of oil and water."

Under date of April 29, 1903, Jackson wrote to Professor Mead in Chicago, as follows:

"It is true that this design of a pump does not take very much material or work after it is once developed, but at present no such pump has been developed and I want to get a price that will help to pay for the developing, and now that I have the order for the Pabst Brewing Company, I propose to make this pump and test it anyway, whether it is ever shipped and installed or not."

In a letter dated May 22, 1903, Jackson refused to sign the contract for the pump, containing a clause providing that there should be no discharge into the well of a mixture of oil and water. He states his objection to that part of the contract as follows:

"In your contract under heading of 'pump' in the line next to the last on the first page, reading as follows:—'which will allow no mixture of the oil and water.' I think this is an impossibility to make such a design, besides my blue-prints are very clear and show that the excess of oil after passing through all the bearings on the line shaft will discharge into the well, and I specially mention this in some of my correspondence with Mr. Mead. This

objection, however, is a common one and was made at Rockford and many other places where we put in city waterworks pumps, but after years of use, the amount of oil passing into the water has not proved a serious item; but if it is a serious item in your case, I do not know how to remedy it and for this reason, if no other, I would have to decline your contract."

Under date of June 9, 1903, Mr. Jackson again wrote to Professor Mead that he would have to decline the Pabst contract, saying:

"I certainly was surprised that they should put in the contract that we would guarantee not to get any oil in the water, as that was impossible."

Again, under date of June 30th, 1903, Jackson wrote to Professor Mead, declining the contract, as follows:

"Now, I shall have to decline to sign this part of the contract, because the undue quantity will all depends upon the amount of oil supplied to the oilers and the use for which the water may be intended, because I know of no method of retaining the oil in the bearings and all of the waste oil is there to pass into the water pumped."

In a letter dated September 5, 1903, Mr. Jackson still objects to the proposed contract, saying:

"You will note that I make no guarantee regarding oil injuring the water or making it in

any way unsuitable for the use of the Pabst Brewing Company. \* \* \* There may be instances where the oil would accumulate on top of the water and be seen and commented on. If the oil is detrimental it is barely possible that some kinds of oil may be less detrimental than others; for instance, sweet oil, cottonseed oil, or even castor oil, might be good for the health."

The pump was finally accepted by the Pabst Brewing Company without the clause in the contract providing that there should be no discharge of oil into the water in the well.

The Layne application for a patent was filed in the patent office April 28, 1903. The dominant element in that invention was the claim for a line shaft for the pump entirely closed off from the water in the well. On the day following, that is to say, on April 29, 1903, Byron Jackson, an experienced and well known manufacturer of centrifugal pumps, who had developed substantially all the other essential elements of the Layne improvement but that one element, declared that a pump with that element in it had not been developed, (not then knowing, of course, of the application for the Layne patent), and on May 23, 1903, he declared that it was impossible to make a pump that would not allow a mixture of oil in the water, and on that account he declined to make the contract with the Pabst Company. This refusal to make a contract with the provision not to allow a mixture of oil and

water in the well, he repeated until it was waived by the Pabst Company and a pump accepted without it.

We think this evidence establishes very clearly that the Jackson mechanism was not an anticipation of that dominant feature of the Layne invention. The defendants' pump is substantially the Jackson mechanism with respect to the discharge of used or spent oil from the bottom shaft into the water of the well, and is therefore not an infringement of plaintiff's patent for an entirely closed casing for the line shaft.

The decree of the Court below is reversed with directions to dismiss the bill, with costs to the defendants.

[Endorsed]: Opinion. Filed October 17, 1921. F. D. Monekton, Clerk. By Paul P. O'Brien, Deputy Clerk.

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In the United States Circuit Court of Appeals for  
the Ninth Circuit.

No. 3627.

WESTERN WELL WORKS, INC., a Corporation,  
ROTARY DRILLING & DEVELOPMENT COMPANY, a Corporation, STANLEY M. HALSTEAD, P. E. VAUGHAN  
and ALLEN W. ROSS,

Defendants-Appellants,

vs.

LAYNE & BOWLER CORPORATION,  
Plaintiff-Appellee.

**Dissenting Opinion of Gilbert, C. J.**

Before GILBERT and MORROW, Circuit Judges,  
and WOLVERTON, District Judge.

GILBERT, Circuit Judge, Dissenting:

I submit that the question of infringement in this case is not determinable upon the mechanism described in the Halstead patent. It is determinable upon the mechanism which was actually used by the appellants at the time of the institution of the suit. The court below found, and it is so shown by the evidence, that while at the outset the appellants may have undertaken to follow the Halstead patent, they had abandoned it at the time when the suit was commenced, and were using great care so to construct their mechanism as to make a perfect union between casing and coupling with the complete exclusion of water; that the joints of their structure were sealed with white lead, and for a considerable distance the space between the driving shaft and the walls of the casing was packed with hard grease. There can be no doubt that the appellee's invention did, as was said in the case of *Getty vs. Layne*, 262 Fed. 141, "accomplish a revolution in the well-drilling industry." And while the invention may not be said to be of a pioneer character, it is, nevertheless, an invention of such merit as to be entitled to protection against a reasonable range of mechanical equivalents. In both the appellee's and appellants' mechanisms

the oil is introduced at the top in substantially the same manner, and by gravity it traverses the entire length of the shaft thereby lubricating all the bearings. In both there is some escape of oil through the lowest bearing. The contention that the two systems are differentiated in that the appellee's lubricating system is static, while that of the appellants' is circulatory is not sustained by the proofs. In the appellants' mechanism, the shaft casing being made impervious to water and packed with hard cup grease a distance above and below each bearing, the ingress of water is prevented, and the movement of the lubricating oil is impeded, so that there is no substantial difference in the operation of the two lubricating systems. Both use a closed casing surrounding the pump shaft from the pump to the top of the well, the casing being sufficiently closed to allow the feeding of a lubricating fluid down through the same to the various bearing parts for the shaft therein. Both accomplish the same result by substantially the same means, operated in substantially the same way. The fact that the appellants' static lubricants are supplemented by the use of an emulsifying oil is unimportant. The fact that in the appellants' mechanism more oil escapes from the lowest bearing than in the appellee's is also unimportant. The ultimate disposition of the lubricant after its office is fulfilled is immaterial. These differences do not enable the

appellants to appropriate the substance of the appellee's invention.

In brief, the evidence shows that the appellants, as does the appellee, use a deep well pump mechanism assembled unit by unit, and lowered into the well bore so as to hang from the surface, the mechanism consisting of: 1, a pump impeller attached to a sectional power shaft extending from the pump to the top of the well, and enclosed in a casing, 2, a water discharge sectional casing extending from the pump casing to the top of the well, 3, a sectional casing extending from the pump casing to the top of the well, provided at the end of each section with a fixed block, with bearings for the shaft closed at the top, the casing being adapted to hold the power shaft in alinement by means of the bearings, to protect the power shaft and its bearings from injurious action of sand or soil in the water, and to form a means for conducting lubricant from the top down through each shaft bearing.

I think that the decree of the Court below should be affirmed.

[Endorsed]: Dissenting Opinion of Gilbert, C. J. Filed October 17, 1921. F. D. Monckton, Clerk. By Paul P. O'Brien, Deputy Clerk.



United States Circuit Court of Appeals for the  
Ninth Circuit.

No. 3627.

**WESTERN WELL WORKS, INCORPORATED,**  
a Corporation, **ROTARY DRILLING & DE-**  
**VELOPMENT COMPANY,** a Corporation,  
**STANLEY M. HALSTEAD, P. E.**  
**VAUGHAN and ALLEN W. ROSS,**  
Appellants,

vs.

**LAYNE & BOWLER CORPORATION,** a Cor-  
poration,  
Appellee.

**Decree U. S. Circuit Court of Appeals**

Appeal from the Southern Division of the Dis-  
trict Court of the United States for the Northern  
District of California, Second Division.

This cause came on to be heard on the Transcript  
of the Record from the Southern Division of the  
District Court of the United States for the North-  
ern District of California, Second Division, and  
was duly submitted:

On consideration whereof, it is now here ordered,  
adjudged, and decreed by this Court, that the de-  
cree of the said District Court in this cause be,  
and hereby is, reversed, with costs in favor of the  
appellants and against the appellee, and that this  
cause be and hereby is remanded to the said Dis-  
trict Court with directions to dismiss the bill.

It is further ordered, adjudged and decreed by this Court, that the appellants recover against the appellee for their costs herein expended, and have execution therefor.

[Endorsed]: Decree. Filed and entered October 17, 1921. F. D. Monckton, Clerk. By Paul P. O'Brien, Deputy Clerk.

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At a stated term, to wit, the October Term, A. D. 1921, of the United States Circuit Court of Appeals for the Ninth Circuit, held in the Courtroom thereof, in the City and County of San Francisco, in the State of California, on Monday, the sixteenth day of January in the year of our Lord one thousand nine hundred and twenty-two. Present: Honorable WILLIAM W. MORROW, Circuit Judge, Presiding, Honorable WILLIAM H. HUNT, Circuit Judge.

No. 3627.

WESTERN WELL WORKS, INC. (a Corporation,  
ROTARY DRILLING & DEVELOPMENT COMPANY (a Corporation),  
STANLEY M. HALSTEAD, P. E.  
VAUGHAN and ALLEN W. ROSS,  
Appellants,

vs.

LAYNE & BOWLER CORPORATION, a Corporation,

Appellee.

**Order Denying Petition for Rehearing, etc.**

The petition, filed November 16, 1921, on behalf of the appellee for a rehearing of the above-entitled cause being duly considered by the Honorable William B. Gilbert and William W. Morrow, Circuit Judges, and the Honorable Charles E. Wolverton, District Judge, before whom the cause was heard, by direction of the Honorable William W. Morrow, Circuit Judge, and the Honorable Charles E. Wolverton, District Judge, ORDERED that the said petition for rehearing be, and hereby is denied, the Honorable William B. Gilbert, Circuit Judge, dissenting from said order.

Upon motion of Mr. William K. White, on behalf of counsel for the appellee, ordered mandate stayed 40 days from date.

United States Circuit Court of Appeals for the  
Ninth Circuit.

No. 3627.

WESTERN WELL WORKS, INC., a Corpora-  
tion, ROTARY DRILLING & DEVEL-  
OPMENT COMPANY, a Corporation,  
STANLEY M. HALSTEAD, P. E.  
VAUGHAN and ALLEN W. ROSS,  
Appellants,

vs.

LAYNE & BOWLER CORPORATION, a Cor-  
poration,

Appellee.

**Certificate of Clerk U. S. Circuit Court of Appeals  
to Record Certified under Section 3 of Rule  
37 of the Rules of the Supreme Court of the  
United States.**

I, Frank D. Monekton, as Clerk of the United States Circuit Court of Appeals for the Ninth Circuit, do hereby certify the foregoing one thousand one hundred and fifty-four (1154) pages, numbered from and including 1 to and including 1154, and comprising three volumes, marked, respectively, Vol. I, Vol. II, and Vol. III, to be a full, true and correct copy of the entire record of the above-entitled case in the said Circuit Court of Appeals, excluding all original exhibits made pursuant to request of counsel for the appellee, and certified

1156      *Western Well Works, Inc., et al.*

under section 3 of Rule 37 of the rules of the Supreme Court of the United States, as the originals thereof remain on file and appear of record in my office.

ATTEST my hand and the seal of the said the United States Circuit Court of Appeals for the Ninth Circuit, at the City of San Francisco, in the State of California, this 26th day of January, A. D. 1922.

F. D. MONCKTON,  
Clerk,

[Seal]

By Paul P. O'Brien,  
Deputy Clerk.

UNITED STATES OF AMERICA, ss:

[Seal of the Supreme Court of the United States.]

The President of the United States of America to the Honorable the Judges of the United States Circuit Court of Appeals for the Ninth Circuit, Greeting:

Being informed that there is now pending before you a suit in which Western Wells Works, Inc., Rotary Drilling & Development Company, Stanley M. Halstead, P. E. Vaughan and Allen W. Ross, are appellants, and Layne & Bowler Corporation is appellee, No. 3627, which suit was removed into the said Circuit Court of Appeals by virtue of an appeal from the District Court of the United States for the Northern District of California, and we, being willing for certain reasons that the said cause and the record and proceedings therein should be certified by the said Circuit Court of Appeals and removed into the Supreme Court of the United States, Do hereby command you that you send without delay to the said Supreme Court, as aforesaid, the record and proceedings in said cause, so that the said Supreme Court may act thereon as of right and according to law ought to be done.

Witness the Honorable William H. Taft, Chief Justice of the United States, the sixth day of April, in the year of our Lord one thousand nine hundred and twenty-two.

WM. R. STANSBURY,

*Clerk of the Supreme Court of the United States.*

[Endorsed:] File No. 28,729. Supreme Court of the United States, October Term, 1921. No. 774. Layne & Bowler Corporation vs. Western Well Works, Inc., et al. Writ of Certiorari. No. 3627. United States Circuit Court of Appeals for the Ninth Circuit. Filed Apr. 18, 1922. F. D. Monckton, Clerk, By Paul P. O'Brien, Deputy Clerk.

United States Circuit Court of Appeals for the Ninth<sup>th</sup> Circuit.

No. 3627.

WESTERN WELL WORKS, INC., a Corporation; ROTARY DRILLING and Developing Company, a Corporation; Stanley M. Halstead, P. E. Vaughan, and Allen W. Ross, Appellants,

vs.

LAYNE & BOWLER CORPORATION, a Corporation, Appellee.

*Stipulation as to Return to Writ of Certiorari.*

It is hereby stipulated and agreed that the certified transcript of record, heretofore furnished by the clerk of the above entitled court for and as part of the Petition of Layne & Bowler Corporation for a

Writ of Certiorari from the Supreme Court of the United States to this Court and filed in the Supreme Court of the United States in connection with said Petition for Certiorari, together with all original exhibits on file herein to be returned herewith, be taken and considered as a return to the Writ of Certiorari issued by the Supreme Court of the United States on April 6, 1922, in the above entitled case and used as the certified record and transcript of proceedings upon which said Writ of Certiorari shall be heard, tried and determined in the Supreme Court of the United States; and that a certified copy of this stipulation, certified by the clerk of this court, together with all said original exhibits herein, be returned to the Supreme Court of the United States in response to said Writ of Certiorari.

Dated: San Francisco, California, April 17, 1922.

(Sgd.)	FREDERICK S. LYON,
(Sgd.)	WILLIAM K. WHITE,
(Sgd.)	LEONARD S. LYON,
	<i>Solicitors and of Counsel for Appellee.</i>
(Sgd.)	CHAS. E. TOWNSEND,
(Sgd.)	FREDERIC D. MCKENNEY,
(Sgd.)	WM. A. LOFTUS,
	<i>Solicitors and of Counsel for Appellants.</i>

[Endorsed:] Stipulation as to Return to Writ of Certiorari. Filed April 18, 1922. F. D. Monckton, Clerk, By Paul P. O'Brien, Deputy Clerk.

United States Circuit Court of Appeals for the Ninth Circuit.

No. 3627.

WESTERN WELL WORKS, INCORPORATED, a Corporation; ROTARY Drilling and Developing Company, a Corporation; Stanley M. Halstead, F. E. Vaughan, and Allen W. Ross, Appellants,

vs.

LAYNE & BOWLER CORPORATION, a Corporation, Appellee.

*Certificate of Clerk U. S. Circuit Court of Appeals to Stipulation as to Return to Writ of Certiorari from the Supreme Court of the United States.*

I, Frank D. Monckton, as Clerk of the United States Circuit Court of Appeals for the Ninth Circuit, do hereby certify the preceding page to be a full, true and correct copy of a "Stipulation as to Return to Writ of Certiorari," filed in the above entitled cause on the 18th day of April, A. D. 1922, as the original thereof remains on file and of record in my office.

Attest my hand and the seal of the United States Circuit Court of Appeals for the Ninth Circuit, at the City of San Francisco, in the State of California, this 18th day of April, A. D. 1922.

[Seal of United States Circuit Court of Appeals, Ninth Circuit.]

F. D. MONCKTON,  
Clerk,  
By PAUL P. O'BRIEN,  
Deputy Clerk.

United States Circuit Court of Appeals for the Ninth Circuit.

No. 3627.

WESTERN WELL WORKS, INCORPORATED, a Corporation; ROTARY Drilling and Developing Company, a Corporation; Stanley M. Halstead, F. E. Vaughan, and Allen W. Ross, Appellants,

vs.

LAYNE & BOWLER CORPORATION, a Corporation, Appellee.

*Return to Writ of Certiorari.*

By direction of the Honorable the Judges of the United States Circuit Court of Appeals for the Ninth Circuit, I, Frank D. Monckton, as Clerk of said Court, in obedience to the annexed writ of certiorari, issued out of the Honorable the Supreme Court of the United States and addressed to the Honorable the Judges of the United States Circuit Court of Appeals for the Ninth Circuit, commanding them to send, without delay, to the said Supreme Court the record and proceedings in the above-entitled cause, do attach to the said writ a certified copy of:

(1) Stipulation as to Return to Writ of Certiorari, the original of which said Stipulation was filed in said cause on the 18th day of April, A. D. 1922; and

(2) Documentary Exhibits: Plaintiff's 1, 2, 3, 5, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17 and 20;

Clasmann Exhibits: 2, 3, 4, 5 and 6;

Defendant's A, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U and W; A1, A2, A3, A4, A5, A6, A7, A8, A9, A10, A11 (2) and A12; M6 and M74;

Blue Prints: 69, 70, 71, 72, 73, 75, 76, 77, 78, 79, 92, 93 and 94; Blue Print—attached to deposition of Jackson et al.

Physical Exhibits: Plaintiff's 4, 6, 8 and 18 (iron sections of shafting and tubings);

Defendant's B, C and V (steel and metal models); X (wooden model of well pump); Y-1, Y-2, Y-4, Y-8 and V-ra (bottles of oils, etc.); Z (metal and iron model for mixing oils, etc.)



Not Marked: Steel shaft runner; Cardboards—drawing and patent plates, eight (8) pieces,

and in accordance with said stipulation, do hereby send the certified copy thereof, together with the original exhibits, to the said Supreme Court as the Return to the said Writ of Certiorari.

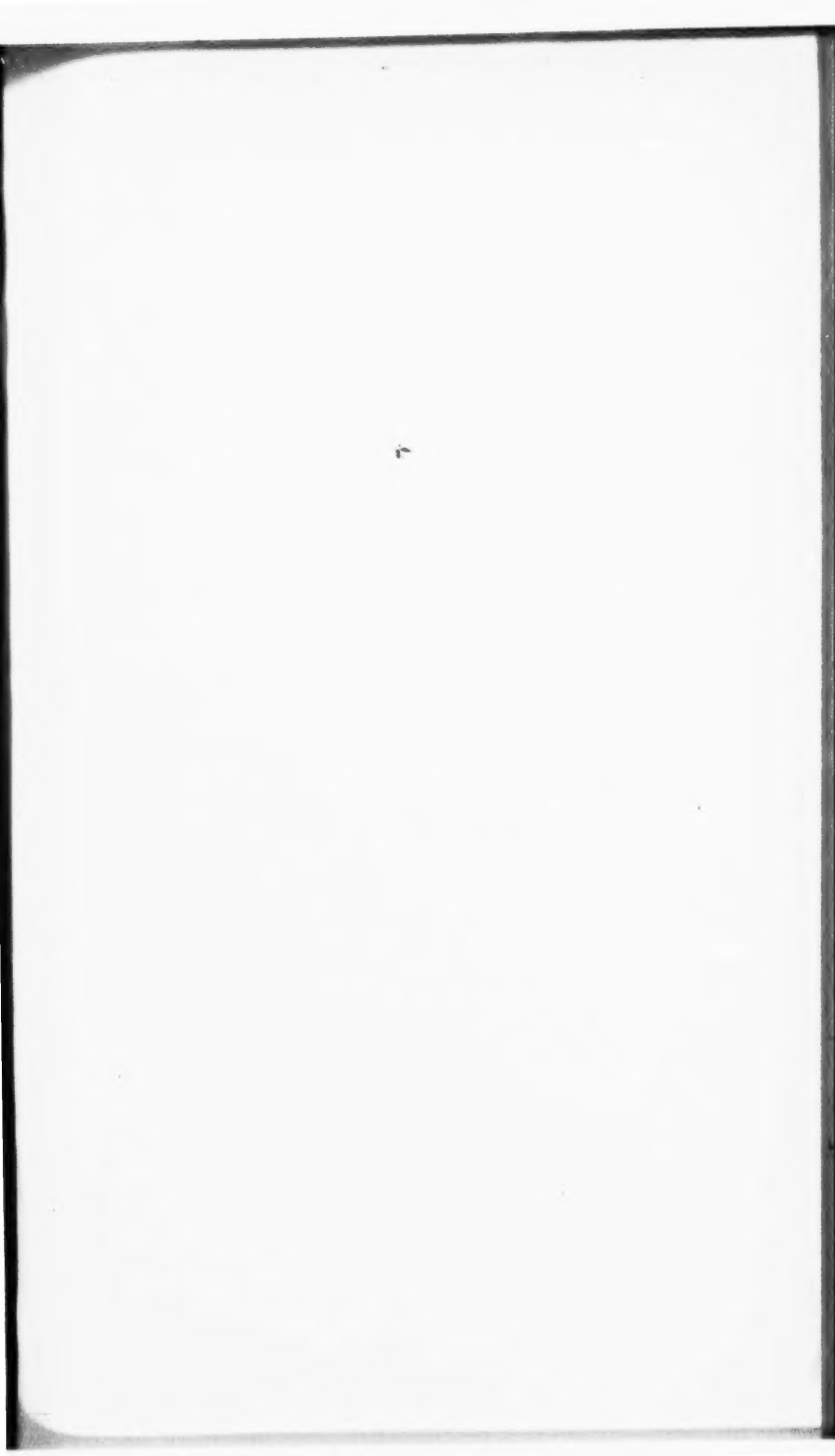
In testimony whereof, I have hereunto set my hand and affixed the Seal of the United States Circuit Court of Appeals for the Ninth Circuit, at the City of San Francisco, in the State of California, this 18th day of April, A. D. 1922.

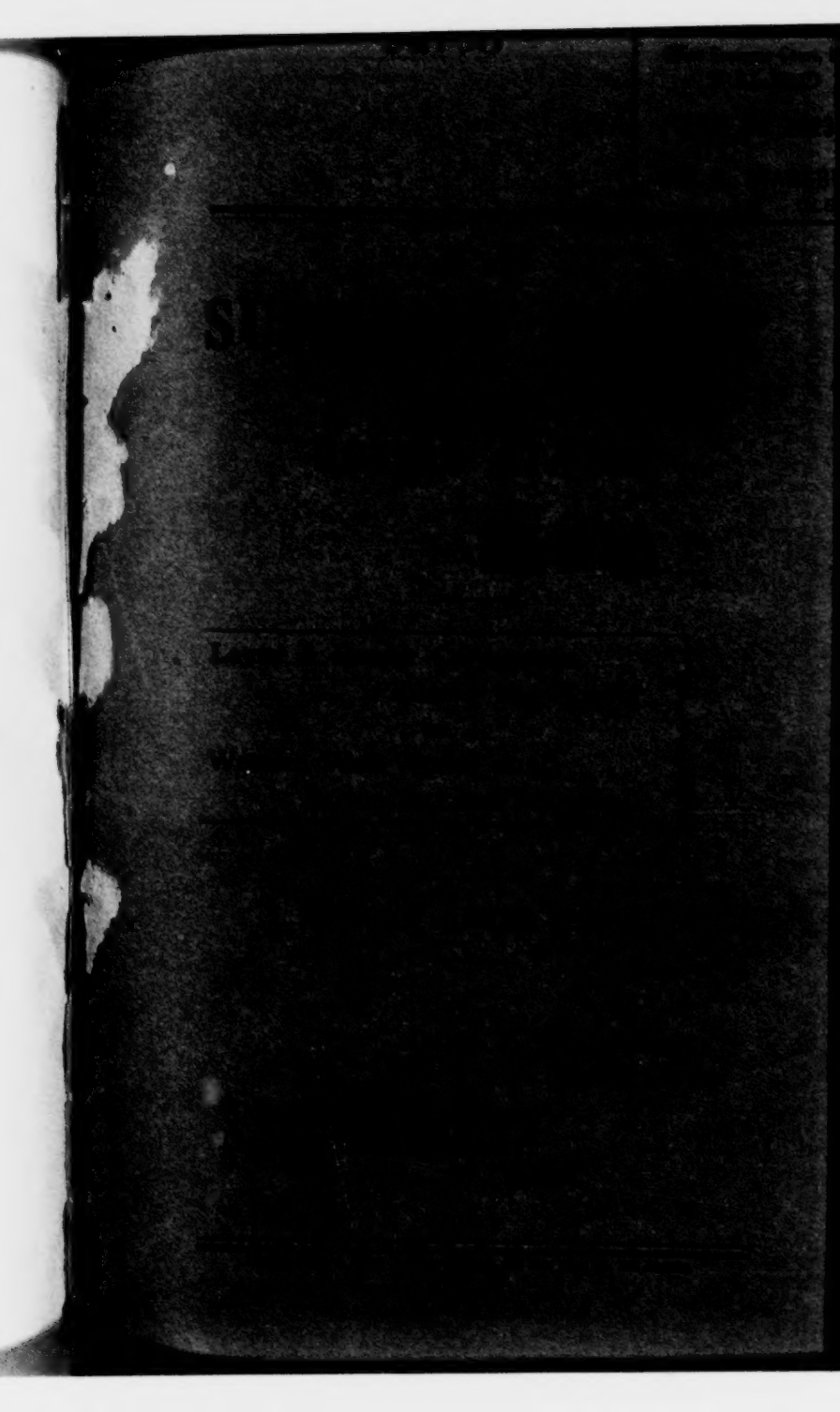
[Seal of United States Circuit Court of Appeals, Ninth Circuit.]

F. D. MONCKTON,  
*Clerk,*

By PAUL P. O'BRIEN,  
*Deputy Clerk.*

[Endorsed:] File No. 28,729. Supreme Court U. S., October Term, 1921. Term No. 774. Layne & Bowler Corporation, Petitioner, vs. Western Well Works, Inc. Writ of certiorari and return. Filed April 24, 1922.





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#### *Foreword.*

(To adjust a pump in a driven well Layne devised, to surround the pump casing, a *system of wedges* to wedge against the well casing and to be manipulated by rods extending to the top of the well.

To carry the weight of the pump driving shaft he made the *shaft extensible* at its *joints* so that each section could be *separately supported*. To carry these sections of shaft he provided a sectional *shaft casing* extending from the wedge mounted pump casing to the top of the well, with *thrust bearing blocks* at the end of each section.

The wedge system was designed to adjust and center this mechanism, to fix it in place and "hold it in proper vertical position."

To *manipulate the shaft packing* he provided a *tubular rod* extending through the top of the shaft casing down to the cap of the bottom stuffing box.

To keep the bearings clean he provided an *air-vent* pipe to be used in co-operation with the tubular rod to force in air to force out fluid at the top.

He also considered it a great advantage to arrange the pump shaft in a closed casing "so that by the use of packing boxes an *air-tight* chamber can be maintained, and water kept out of the casing 20, or kept filled with clean liquid" for "a lubricating system".)

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IN THE  
**SUPREME COURT**  
OF THE  
**UNITED STATES.**

No. 774.

Layne & Bowler Corporation,  
*Petitioner and Plaintiff.*

*vs.*

Western Well Works, et al.,  
*Respondents and Defendants.*

**BRIEF OF AMICUS CURIAE.**

*May It Please Your Honors:*

I.

**STATEMENT.**

**Purpose of This Brief.**

This suit is for alleged infringement of Layne Patent No. 821653, issued May 29, 1906. The District Court for the Northern District of California found claims 9, 13 and 20 of the patent, valid and infringed. The Circuit Court of Appeals for the Ninth Circuit reversed the decree, finding non-infringement. Plaintiff thereupon obtained certiorari from this court on the ground of alleged conflict of decisions be-



tween the Ninth and Fifth Circuits as to the interpretation of the patent.

As friends of the court, we have obtained leave to file this brief, to explain the restricted nature of the patent's claims under the adjudications; and the very narrow nature of the invention, if any; and to discuss the scope and argue the invalidity of the claims in suit.

We purposely refrain from any comment upon, or discussion of, the alleged infringement by respondents' structure in order not to interfere with matters which do not concern us.

But, for the benefit of the public, the scope of the patent should be definitely fixed within limits not broader than those adjudicated in the Circuit Court of Appeals in the Fifth and Ninth Circuits, which have passed upon it. And the new defenses in the present case should be given due effect showing the invalidity of the claims involved.

(*Note*—Unless otherwise indicated, italics in quotations are ours. R refers to the record with page number following.)

## II.

### WHAT DID LAYNE INVENT?

---

#### Layne's Objects and Means of Accomplishment, as Stated in the Patent.

Turning to the patent, an analysis of the objects, there stated, shows clearly what Layne attempted.

Mr. Layne's basic or underlying idea was of means for adjusting a water pump within a driven or artesian well.

The patent's introductory statement is:

"My invention relates to the apparatus used for drawing water from driven or Artesian wells, and *particularly* to the *means for adjusting a pump* therein." (Patent p. 1, ll. 8-11.)

The pump in common use at the time Mr. Layne and the others were developing their conceptions of a small bore deep well pump, was the "pit pump," so called because it was set on the bottom of a large open pit. Mr. Layne conceived the idea that by mounting a pump on a series of wedges instead of on the bottom of the open pit he could adjust the pump in a driven or artesian well.

This he proposed to accomplish by mounting the pump on wedges adjustable from the top of the ground by means of links, rods and sliding collars and in a modified form by means of screws and rods.

(1) *Means of Assembly — Wedge System.* The first stated object in the patent is "to provide means by which the piping and the pump may be all assembled in proper shape before inserting it into the well." (Patent p. 1, ll. 12-15.)

The patent specification provides for attaching a pump casing to a shaft casing, the shaft casing carrying a shaft within, and running to the top of the well, bound together with a

side water discharge pipe—the assembled whole to be supported on a series of wedges. Thus he devised a “self-contained” apparatus which can be put together at the surface and lowered into the well as a whole.

The patent provides for assembly as follows:

“In order to *previously assemble* all the parts and then put the pump into the well and fix it in position therein, I provide a system of wedges 33, which serve to fix the pump in place and hold it in proper vertical position, designed to be operated by means from the top of the well, avoiding the necessity of a man’s going into the well in order to fix the pump in place.” (Patent p. 2, ll. 1-10.)

With respect to the *manner* of assembly the patent states:

“The *whole apparatus* being self-contained, can be put together in proper form and lowered into the well *at once*.” (Patent p. 3, ll. 66-69.)

The patent also states that by supporting the weight of the shaft in sections on blocks at the ends of the shaft casing sections that the pump shaft and shaft casing can be made in separable sections “and the parts *assembled before* putting them in the well.” (Patent p. 2, ll. 104-105.)

(2) *Placing and Fixing Position by Wedges.* The second stated object is “to provide means by which a pump may be placed in any desired position in a well, centered, raised or lowered and fixed in position by manipulating from the outside entirely.” (Patent p. 1, ll. 15-19.)

These means were the wedges, adjustable from the top of the ground by means of links, rods and sliding collars and in a modified form by means of screws and rods.

The importance of this object is emphasized by the fact that claims 1, 2, 3, 4, 5, 6, 7, 8, 12, 18, 21 and 22 (*twelve out of twenty-two claims allowed*) contain these elements, claims 6, 7, 8 and 12 being specific claims for the links, rods and collars. So also, five of the six rejected claims, original claims 1, 2, 9, 21 and 24, cover the wedges.

Mr. Layne conceived as his basic idea that a pump could be mounted on a series of wedges within a bored well and adjusted therein by means of links, collars and rods, "so that from the top the wedges 33 may be raised and lowered into place and can be tightened therein" (Patent p. 2, ll. 21-23), and manipulated "without going into the well." (Patent p. 2, ll. 26-27.) Mounting the pump on the wedges 33 obviated, in the inventor's conception, placing the pump on the bottom of the large open pit.

A series of co-operating wedges 62 and 63 are provided for a modified form of mounting.

The patent reads:

"Fig. 11 is a side view and partial section of a centrifugal pump *mounted* by a modified method." (Patent p. 1, ll. 72-74.)

Claim 3 describes the wedges as, "means for *supporting* the pump at any desired point in the well."

Claim 4 describes the wedges as,  
“means for *supporting* the pump and shaft and casing at any desired point within the well.”

*Van Ness v. Layne* (C. C. A. 5th Cir.), 213 Fed. at p. 806, specifically adjudicates this element of claim 4 to be the wedges.

(3) *Adjusting Means — Wedge System.*  
These same means of assembly, and for placing and fixing the pump in positions are also available to accomplish another stated object, “to provide means for adjusting the length of the piping leading from the pump to the surface at will and to lower the pump from time to time without taking it out of the well.” (Patent p. 1, ll. 19-23.) After loosening the wedges the structure could be lowered or raised and by drawing up the rods attached to the links could be again tightened in place.

In the *Van Ness* case (C. C. A.) the court said:

“We are satisfied, after reading the specifications and other claims of complainant’s patent, that the reference to the concluding element of this claim is to the system of wedges and not to the adding and subtracting of sections. Claim 6 expressly designates the system of wedges as the ‘means for fixing the pump in position at any desired point in the well casing,’ by the use of the final words ‘for the purposes specified,’ referring to the purposes declared in the preceding claim as quoted. Then the addition or withdrawal of sections

does not accomplish the fixing of the pump casing at any desired point in the well, but only at certain points where the joints between the sections are located, whereas, by the wedge system the apparatus can be fixed at any point whatever in the well.

"For these reasons we do not find that defendant's pump infringes claim 4, since it admittedly has no system of wedges." (213 Fed. 806.)

(4) *Centering with Wedges.* The wedges being in series, three being indicated around the pump, were available also as "improved means for centering and fixing the pump in proper position in the well casing." (Patent p. 1, ll. 23-25. See (2) *supra* also.)

Claim 2 covers this, reading:

"means for fixing the pump at any desired point in the *center* of the well casing."

Also rejected original claim 2 describes them as,

"centering and wedging devises."

(5) *Manipulation of Shaft Packing.* Inasmuch as the shaft casing is to be inserted in a driven well into which a man could not descend it was one of the inventor's further objects "to provide improved means for manipulating the packing of the pump shaft" (Patent p. 1, ll. 25-27) in order to maintain the "air-tight chamber" for lubrication. (Patent p. 3, l. 78.) Like the manipulation of the wedges this must also be done from the top of the well. For this purpose a tubular rod 44 was

run down inside the shaft casing to operate a screw provided with a sprocket wheel to turn two other screws at the same time to compress the packing in box 40." (Patent p. 2, ll. 66-82.)

(6) *Adjustment in Place by Wedge System.* The wedges with the sliding collars, rods and links and, in the modified form, screws and rods, serve the purpose stated, to provide "proper adjustment of the pump in place by means at the surface of the ground." (Patent p. 1, ll. 27-29.)

These means are described with great particularity, for the preferred form page 2, lines 10 to 35; and for the modified form, page 2, lines 115 to 124, 127 to 130, and page 3, lines 1 to 14 of the patent.

Four specific claims were allowed to cover these features and another proposed but rejected.

Claim 6. "\* \* \* a series of wedges operated from the top of the well by means of links, a series of wedges carried by the pump casing and operated by toggle links attached to a rod extended to the top of the well,"

Claim 7. "\* \* \* a series of wedges suspended by rods from the top of the well for operating the same to wedge the pump casing

Claim 8. "\* \* \* a series of wedges mounted upon toggle links therein to wedge the said (pump) casing against the side walls of the well casing \* \* \*

Claim 12. "\* \* \* wedges \* \* \* a collar thereon (on the shaft casing) and links

extending from said collar to the top of the well and to said wedges.”

Rejected claim original 9 on the modified form of wedges. “\* \* \* of two series of wedges with means for moving them in relation to each other. \* \* \*”

(7) *Control of Water Flow by Annular Wedges.* The co-operating wedges 62 and 63 also have another function; to seal off the well, or to control the flow of the water.

By reason of this they fulfill the object, “to provide for the proper action of the pump without stopping up the well, so that water may be either flowed into or pumped out of the same at pleasure.” (Patent p. 1, ll. 29-32.)

Claim 2. “\* \* \* means for fixing the pump at any desired point in the center of the well casing and sealing said shaft off from the water in the well. \* \* \*”

Rejected original claim 9. “\* \* \* of two series of wedges with means for moving them in relation to each other. \* \* \*”

Rejected claim 24. “\* \* \* means whereby water is prevented from passing between the casing and the pump into the well.”

Claim 20. (Proposed after the rejection of original claims 9 and 24.) “\* \* \* a line shaft for the pump entirely closed off from the water in the well.”

Claim 22. (Before amendment “\* \* \* a shaft casing, and a discharge outlet from the pump independent of the shaft casing and sealed off from the well casing below the pump.” [R. 981.]

(8) *Mounting for the Pump, Wedges Manipulated from the Surface.* As above stated



the wedges were "to provide a superior mounting for a centrifugal pump in the well, manipulated from the surface of the ground" (Patent p. 1, ll. 32-35.)

(9) *Extensible Shaft Supported at Intervals in Each Section of Shaft Casing.* Another special object stated in the patent is "to provide an extensible pump shaft separately supported at intervals along its length." (Patent p. 1, ll. 35-37.)

Doing away with the open pit (which was not first accomplished by Layne) precluded the use of the open pit framework with step bearings for the shaft, and some other means were required for supporting the weight of the long heavy driving shaft with the pump impellers attached.

Byron Jackson had devised the single thrust bearing to suspend the shaft from the top of the well. Layne, however, thought that by making his shaft in sections and supporting each section of shaft on a thrust bearing held in place by the shaft casing he could satisfactorily support the weight of the shaft.

The specification reads:

"The weight of the shaft and pump below the block 47 is carried on the block 48; and from figure 8 it will be seen that a similar arrangement is made at the top of the next section of the shaft casing, where the block 47' supports the weight of the section of shaft 39' by means of the collar 48', connected by a pin and key as before." (Patent p. 2, ll. 49-57.)

Again the specification reads:

"It will be noted that the *weight of the pump and its shaft is supported at each end of the sections* of the casing by the blocks 47, 47' etc." (Patent p. 2, ll. 97-100.)

(10) *Automatic Centering by Wedges.* "To provide an *automatic* centering device for the pump in the well (Patent p. 1, ll. 37-38) the patent provides: "the wedges alone will be amply sufficient" (Patent p. 3, ll. 69-73) without the toggle levers to center the pump casing and hence would fulfill this object.

(11) *Mounting the Pump and Shaft on Thrust Collars Supported by Bearings Carried in a Closed Casing.* To give the shaft sectional support Layne provided, as stated above, a sectional shaft casing, extending to the top of the well, with thrust bearing blocks at the ends of each section, carrying thrust collars for the shaft sections. The casing is enlarged at the couplings in order to hold the bearing blocks in place. This gave means for the object stated "to provide for *mounting* the pump and the shaft in a closed casing which is open to operate from the top." (Patent p. 1, ll. 38-41.)

The patent reads:

"Fig. 7 is a section of a top of the well casing containing the pump shaft and its *mounting*." (Patent p. 1, ll. 63-65.)

(12) *Obviating Large Wells by Wedge System.* By mounting the pump on a series of wedges "designed to be operated by means from

the top of the well, avoiding the necessity of a man's going into the well in order to fix the pump in place" (Patent p. 2, ll. 7-10), he provided the means for accomplishing the object, "to obviate the necessity of making large wells in order to descend into them in order to arrange the pump \* \* \*." (Patent p. 1, ll. 41-43.)

(13) *Improving and Cheapening the Apparatus by the Wedge System*. "generally to improve and cheapen the appartus used for the above purposes" (Patent p. 1, ll. 44-45) would also be accomplished by the wedge system doing away with the large pits.

The objects of the patent in the order of their statement, with the means for their accomplishment, may be summarized as follows:

1. *Assembly* as a whole by means of the *wedge* system and supporting the weight of the shaft in separate sections.
2. *Placing and Fixing in Position*, manipulating from the outside entirely by means of *wedges*, links and sliding collars, and in the modified form by concentric *wedges* operated by rods or screws.
3. *Adjustment of Length and Lowering* by means of *wedges* with rods and links and by sectional weight support of the shaft.
4. *Centering* by means of *wedges*.

5. *Manipulation of Shaft Packing* by means of the tubular rod, the sprocket wheel and screws for tightening the bottom stuffing box.

6. *Adjustment in Place* by means of *wedges*, links, collars and screws.

7. *Control of Water Flow* in modified form by means of a co-operating series of annular *wedges*.

8. *Mounting* the pump on *wedges* manipulated from the surface.

9. *Supporting the Extensible Shaft* by means of thrust bearings and collars.

10. *Automatic Centering* of the pump by means of *wedges*.

11. "*Mounting* the pump and shaft" by means of thrust bearings and collars, "in a closed casing," the casing being closed by the lower thrust bearing, stuffing boxes and sleeve bearings, but "which is open to operate from the top" through the tubular rod and air vent pipe.

12. *To Obviate Large Wells* by a system of *wedges* operated from the top.

13. *To Improve and Cheapen* the apparatus by means of the system of *wedges* to support the mechanism within a driven or artesian well.

### Summary.

From the above analysis it appears that what Layne invented was in the main as follows:

(1) "Means for adjusting a pump" in "driven or Artesian wells," to-wit: "*a system of wedges*" which "serve to fix the pump in place." (Patent p. 1, ll. 10-11; p. 1, ll. 9-10; p. 2, ll. 4-5.)

A "modified form of apparatus which uses *a simple series of wedges* for fixing the pump in place" and for controlling the flow of water. (Patent p. 2, ll. 113-114, 115 *et seq.*)

(2) "An *extensible pump shaft* separately supported at intervals along its length." (Patent p. 1, ll. 35-37; p. 2, ll. 36-57.)

(3) Means "*for mounting the pump and the shaft* in a *closed casing* which is open to operate from the top," to-wit: mounting *bearing blocks* for the shaft sections at the ends of each section of shaft casing to support the shaft's weight in sections, the pump being attached to the lower section of shaft. (Patent p. 1, ll. 39-41; p. 2, ll. 49-57, 97-100.)

The shaft casing "is open to operate from the top" through two pipes. One is a tubular rod to manipulate the pump shaft packing. (Patent p. 1, ll. 25-27; p. 2, ll. 66-82.) The other is an *air vent* for "forcing in air" whereby "the fluid can be forced out at the top" through the opening in the tubular rod. (Patent p. 2, ll. 83-97.)

(4) An additional advantage is alleged for this arrangement "that by the use of the packing boxes an *air-tight chamber* can be main-

tained, and water kept out of the casing 20, or kept filled with clean liquid, if desired, thereby providing an efficient lubricating system for all the bearings of the pump." (Patent p. 3, ll. 74-83.)

### III.

#### WHAT DO THE CLAIMS IN CONTROVERSY COVER?

The next subject on inquiry is as to what of this alleged invention is covered by the claims in controversy.

##### **The Claims in Controversy, 9, 13 and 20.**

Claim 9. "In well mechanism the combination with a pump casing, of a rotary pump of a jointed pump shaft and a closed casing surrounding the pump shaft from the pump to the top of the well."

Claim 13. "The combination with a pump and its actuating shaft of a sectional casing therefor provided at each end of each section with a fixed block with bearings for the shaft, the casing being closed at the top and provided with an air vent."

Claim 20. "The combination of a well casing, a rotary pump therein, and a line shaft for the pump entirely closed off from the water in the well."

Referring to the just preceding "Summary" it appears that there are four main elements in Layne's invention: (1) wedges (in modified form, water-tight) to fix the pump in place; (2) an extensible shaft sectionally supported; (3) mounted in a closed casing on thrust bear-

ings (4) the casing extending to the top of the well with a tubular rod through its top to manipulate the lower stuffing-box and an air-vent pipe at the top to keep the bearings clean by air pressure to force out spent fluid, the casing to be maintained as an "air-tight chamber" to be "kept filled" with clean liquid. Considering these elements and the above-quoted claims together we find as follows:

(1) Layne invented a *system of wedges* to adjust a pump in a driven or artesian well, wedging within the well casing a pump casing with side water discharge pipe and center shaft casing extending therefrom to the top of the well. A modified form controls the flow of water whereby the shaft may be "entirely closed off from the water in the well."

Claim 20 seems to be intended to cover this feature of the modified form. The concentric or annular wedges make the platform and pump casing water-tight within the well casing to thus make the shaft, as stated in claim 20 "entirely closed off from the water in the well," or as also expressed in claim 2 (not in suit) means "sealing said shaft off from the water in the well."

(2) As part of his invention Layne provided for a *shaft extensible* at its joints so that each section could be *independently supported* by collars resting on bearing blocks carried at the ends of the sections of shaft casing.

Claim 9 is intended to cover, among other elements, the "jointed" feature of the shaft.

Claim 13 specifically mentions the bearing blocks at the end of each section of shaft casing.

(3) The shaft casing "*mounting the pump and shaft*" as above mentioned by the bearing blocks carried at the end of each section, is "open to operate from the top" by a tubular rod, "for manipulating the packing of the pump shaft," and also by an "air vent" pipe to force in air to force out fluid through the opening in the tubular rod.

Claim 13 includes the bearings at each end of each section of shaft casing to support each section of shaft, and also the "air vent" for forcing in air to force out fluid.

(4) The shaft casing is closed at top and bottom by stuffing boxes "so that an *air-tight chamber* can be maintained, and water kept out" or "kept filled with clean liquid" thereby providing a "lubricating system."

Claim 9 covers this "closed casing."

Claim 13 stresses the closure at the top.

Claim 20 does not mention the casing, but it has been erroneously read in as a means to make the shaft "entirely closed off from the water in the well."



IV.

**CLAIM 9.**

Claim 9. "In well mechanism the combination with a pump casing, of a rotary pump of a *jointed pump shaft* and a closed casing surrounding the pump shaft from the pump to the top of the well."

**The Jointed Pump Shaft.**

One of the elements in claim 9 is "a jointed pump shaft."

The patent specification describes this "jointed pump shaft" as follows:

"The pump shaft also is made in sections 39, 39', 39'', which are attached together by means of sliding keys so as to allow of some vertical play with relation to each other. From figure 5 it will be seen that the shaft 39 passes through a block 47, and at its top is fixed in the bearing block 48 by means of the pin 50, as shown in figure 4. The next section of the shaft, 39', is inserted into the block 48, and prevented from rotating by means of the key 49, which is splined therein. The weight of the shaft and pump below the block 47 is carried by the block 48; and from figure 8 it will be seen that a similar arrangement is made at the top of the next section of the shaft casing, where the block 47' supports the weight of the section of shaft 39' by means of the collar 48', connected by a pin and key as before." (Patent p. 2, 11.38-57.)

The Layne file wrapper and contents show the following action taken with regard to claim 9, which is exceedingly illuminating as to the meaning of the term "jointed pump shaft."

Claim 9 was originally claim 12, which reads:

"In well mechanism the combination with a rotary pump of a jointed pump shaft and a closed casing surrounding the pump shaft from the pump to the top of the well." [R. 973.]

The patent office examiner, June 1, 1903, among other things stated [R. 977]:

"Claims 12 (*now* 9), 13 (*now* 10) and 18 (*now* 15) are rejected on the ground that it would not require invention to form the extensible shaft shown in the patent to Northam [R. 1029] with *joints* such as are shown in the patent to Barker, 264997, Sept. 26, 1882, Journal Boxes, Pullies and Shafting, Shafting."

In response to this letter Mr. Synnestvedt, Layne's attorney, on June 30, 1904, wrote the examiner, among other things:

"The references have been carefully examined. The examiner's attention is first called to the fact \* \* \* and that the line shaft is supported at various points in the various sections, \* \* \*" [R. 981.]

In this same letter, distinguishing Crannell, Layne's attorney, says: "\* \* \* and the line shaft is not extensible, \* \* \*" [R. 982.]

Layne's attorney also wrote:

"It does not appear how the Northam [R. 1029] pump can be held to show an extensible shaft inasmuch as the shaft that belongs to any one of the pumps is not extensible and the only way to extend the shaft at all is to put in a new pump \* \* \*"

"The Barker device is not applicable as a reference to this case because it does not allow any play in the shaft itself; it merely allows the *entire shaft to move as a unit* through the

bearings and *this is not a feature which is applicable to this applicant's device* \* \* \*” [R. 982.]

The Northam patent [R. 1029] does not show a pump shaft which is extensible, but a series of pump shafts, each one of which is integral. \* \* \*” [R. 983.]

On February 15, 1904, the examiner again objects to the claim which had been renumbered as claim 9, saying:

“Claim 9 does not distinguish in terms from an aggregation of Northam [R. 1029] and Crannell [R. 1022], both of record, and is rejected.” [R. 985.]

Northam has a jointed pump shaft, Crannell has a shaft-enclosed casing.

The Northam patent describes the shaft as coupled by universal joints consisting of knuckles secured by pins.

The Northam patent states:

“\* \* \* the jointed pump shaft being adapted for well-casings that have become bent in driving \* \* \*” [R. 1033, ll. 38-40.]

From the above record it is apparent that the “jointed pump shaft” of claim 9 is one which is so jointed as to be extensible, and support given to the weight of the shaft in sections. It could not be suspended as an entirety, nor does it allow “the entire shaft to move as a unit through the bearings” like Barker in the prior art (*supra*). The latter structure is the universal modern practice, and which Layne himself follows rather than his patent.

The other claims with the shaft as an element show that these features of extensibility and of sectional weight support are of the essence of the patent's shaft structure, and coincide with Layne's object "to provide an extensible pump shaft separately supported at intervals along its length." (Patent p. 1, ll. 35-37.)

### Claims Including the Shaft.

3. "\* \* \* an extensible pump shaft \* \* \* independent supports for the shaft."
4. "\* \* \* extensible pump shaft. \* \* \*"
9. "\* \* \* *jointed* pump shaft \* \* \*"
10. "\* \* \* a pump shaft supported at intervals by blocks pinned thereto and having *splined joints* in said blocks whereby the different sections of the pump shaft may have vertical play with relation to each other."
13. "The combination with a pump and its actuating shaft of a sectional casing therefor provided at each end of each section with a fixed block with bearings for the shaft \* \* \*"
15. "\* \* \* a pump shaft made in sections independently supported and *joined* by blocks and keys in the blocks and ends of the shaft sections \* \* \*"
16. "A pump shaft made in sections, each section being suspended on a bearing by means of a block pinned to the shaft section and the next section being splined into said block to rotate therewith."
17. "\* \* \* the shaft and casing being in sections and connected by bearings at each end, and the shaft section being separately supported in each section of the casing \* \* \*"
19. "A pump shaft made in independently supported sections \* \* \*"

20. “\* \* \* a line shaft for the pump  
\* \* \*”
21. “\* \* \* an extensible line shaft for  
the pump \* \* \*”

Alvord in his patent 735,691, page 1, lines 23-27, says, in his application filed December 24, 1902:

“The weight of this upright shaft and other rotating parts, together with the superimposed water column, is very great and it is a serious problem to guide and *support* the shaft.” [R. 936.]

To change Layne’s form of bearing would take the weight of the shaft off its casing and would require the use of means not at that time developed to suspend and support the shaft’s great weight.

To change the form of the thrust bearings would remove from the top of the sleeve bearings the physical obstruction of the weighted collars, than which no tighter closure has been devised. Water cannot get in nor oil out. The use of them necessitated a separate pipe by which Layne thought he could blow out spent lubricant. To meet that necessity, the inventor devised his adjustable stuffing box whereby he could screw the cap down tight and make, as he says, an “*air-tight* chamber” so that by means of an air vent he may blow out the used fluid.

Layne himself by his own testimony and that of his experts in former cases, and by the argu-

ments of his attorneys, showed how tight a closure was obtained by the use of *thrust bearings*.

Undoubtedly the "jointed shaft" is one slip-jointed as described in the patent to be carried section by section on thrust bearings.

Without sectional support Layne's shaft would fall apart as each splined key would allow its section to separate from the section next below.

The Fifth Circuit in the Van Ness case did not consider the jointed shaft as one with splined keys and pins as described in the patent, but nevertheless refused to sustain this claim 9 in addition to claim 20 with its "line shaft."

The Circuit Court of Appeals, Ninth Circuit, in the present case did not rely on the *jointed* shaft, as a distinguishing element in finding non-infringement, but contented itself with limiting the claim to the "entirely closed shaft casing."

In the interest of this industry we urge upon this court the further limitation of this claim 9 to the sectional extensible weight-supported shaft carried by bearings in each section of shaft casing and incapable of support *as a unit* by ball bearings at the top.

## V.

### CLAIM 13.

"The combination with a pump and its actuating shaft of a sectional casing therefor pro-

vided at each end of each section with a fixed block with bearings for the shaft, the casing being closed at the top and *provided with an air vent.*" (Patent p. 2, ll. 32-37.)

### The Air Vent.

In the case of *Van Ness v. Layne* (C. C. A. 5th Cir.), 213 Fed. 804, the court held that claim 13 was not infringed by a structure that did not have an *air vent* whereby to force out water or spent lubricant. The court said, page 805:

"In the present case we are satisfied that claim 13 is not infringed by the Van Ness pump. The last clause of claim 13 reads 'the casing being closed at the top and provided with an air vent.' While the Van Ness pump is closed at the top, it is not contended that the pump has an air vent such as the patented pump had and such as the El Campo pump had. One function of this air vent is to force any water or spent lubricant remaining in the casing, out of it, through an aperture in the top, by forcing air through the air vent into the casing, for the purpose of substituting clean liquid or oil. It seems clear that the Van Ness pump had no such member with a corresponding function as the air vent of the patented pump or that of the El Campo pump, and so cannot be said to infringe claim 13. This, if correct, would prevent complainant from relying upon claim 13 in this case, as a ground of recovery."

No pump mechanism having a drive shaft enclosing casing would infringe claim 13 unless said casing were provided with such venting

orifices as adapted it to discharge water or spent lubricants in a manner similar to that disclosed by the patent. The means described in the patent are a tubular shaft 44 in combination with pipe 52.

The specification provides as follows:

"This pipe or tubular shaft 44 also serves the purpose of providing convenient means for forcing the liquid out of the pump shaft casing. By forcing air in at the top of the casing 20, by means of the pipe 52, the liquid can be forced down to the bottom of said casing 20, and by means of the small opening 45, in the bottom of the tubular shaft 44, the fluid can be forced out of the top 54, and keep the casing clear in order to leave the bearings clean therein and not interfere with the working of the pump, or by forcing fluid in at the top 54, the operation will be reversed, and the fluid ejected from pipe 52." (Patent p. 2, ll. 83-96.)

The Van Ness decision has ruled against plaintiff's contention and there is nothing in the patent which would lead to a contrary conclusion.

The claim was not sued on in the Getty case.

Claim 13 is the only place in the patent where the term "air vent" is used.

Plaintiff claims that Layne's "air vent" serves the same purpose as a vent in a coal-oil can. A vent in an oil can acts passively to admit air for the purpose of filling the space made vacant by the diminishing oil. Layne's patent specification, above quoted from, emphasizes the compulsory evacuating of liquid by



forcing in air or fluid at the top of the casing and through a pipe or tubular shaft. We again quote this specific language.

"This pipe or tubular shaft 44 also serves the purpose of providing convenient means for *forcing* the liquid out of the pump shaft casing. By *forcing* air in at the top of the casing 20, by means of the pipe 52, the liquid can be *forced* down to the bottom of said casing 20, and by means of the small opening 45, in the bottom of the tubular shaft 44, the fluid can be *forced* out *at the top* 54, and keep the casing clear in order to leave the bearings clean therein and not interfere with the working of the pump, or by *forcing* fluid in at the top 54, the operation will be reversed, and the fluid ejected from pipe 52." (Patent, p. 2, l. 83-96.)

Throughout the foregoing the idea of *forcing* air or liquid is stressed, and *always through pipes provided for that purpose*.

This idea was voiced in the Van Ness, C. C. A. case where the court said (213 Fed. 805):

"One function of this air vent is to *force* any water or spent lubricant remaining in the casing, out of it, through an aperture in the top, by *forcing* air through the air vent into the casing, for the purpose of substituting clean liquid or oil."

The air vent means of the patent has as its only purpose and function the ejection of spent fluid *at the top of the casing*. Discharge at the bottom of the casing is not an equivalent mode of operation, and a structure so discharging at the bottom and not the top could not infringe Claim 13.

Moreover, the pipe 44 is shown as being closed at its top by means of a valve or plug 54, from which it is obvious that Layne's idea was a stagnant system of lubrication, just as the Circuit Court of Appeals for the 5th Circuit held in the case of *Layne v. Getty*, 262 Fed. 141, followed and quoted by the 9th Circuit, in *Western Well Works v. Layne & Bowler Corporation*, 276 Fed. p. 471. The two circuits are in accord as to this stagnant system, being the lubricating system of the patent.

*Getty v. Layne* (5th Cir.), 262 Fed. 141, is quoted by *Western Well Works v. Layne & Bowler Corp.*, 276 Fed. 471, in part as follows:

"Layne's method of lubrication was to put the oil in at the top and to permit it to \* \* \* remain stagnant \* \* \* until ejected from the top \* \* \* by air pressure through an *air vent*."

The Ninth Circuit Court of Appeals in the present case did not rely on the "air vent" as a distinguishing feature in finding non-infringement, but confined itself to the "entirely closed casing" as a necessary limitation to be read into said claim and preventing a finding of infringement by defendant's structure in this case.

Again, however, in the interest of this industry we urge upon this court the further limitation of this claim to an "air-vent" specifically in accordance with that defined in the patent as above indicated and as adjudicated

in the Fifth Circuit, in *Van Ness v. Layne* (C. C. A. 5th Cir.), 213 Fed. 804.

VI.

**CLAIM 20.**

Claim 20—"The combination of a well casing, a rotary pump therein, and a line shaft for the pump entirely closed off from the water in the well."

**The Elements of Claim 20.**

There are only three elements expressed in this combination claim: (1) a well casing, (2) a rotary pump, (3) and a line shaft for the pump.

The "rotary pump" has the descriptive word "therein" following it, referring to the well casing. The "line shaft" is described as "entirely closed off from the water in the well."

The claim is a *combination* claim. The combination of elements must have an operative or sub-operative function as the combination itself is old—a well casing, pump and shaft. The combination to be valid, therefore, should have some novelty of operation, function or construction, giving some new or improved and useful result.

(1) *The well casing* of claim 20 is not discussed by plaintiff's counsel. We do not have his views of what the function of the well casing is in this combination, nor how it contributes to impart an operative or sub-operative

function to the rest of the claim, or produce a new, improved or useful result.

As a mere receptacle for the pump and its drive shaft, the well casing 16 does not contribute to the operation of the rotary pump or drive shaft because they could operate just as efficiently in a well without a well casing, a pit, a pond, a lake or a river.

If the function of the well casing is to act as a water discharge conduit for the water in combination with a rotary pump and line shaft, then the combination is made up of co-operative elements—the line shaft to drive the pump, the rotary pump to lift the water from the well and the well casing to carry it to the surface of the ground.

If this be the intent of the claim then the wedges 62 are required as a sealing means to make the platform 61 water-tight.

The specification provides as to this:

“The pump casing has a platform 61, and a depending ring flange 66, and a series of wedges 63 are placed around the depending flange 66, and are connected to the top platform by means of a series of screws 65. A series of co-operating wedges 62 may also be provided, suspended from the platform 61 by means of the screws 64, and the two series of wedges surround the whole casing. It will, sometimes be convenient to dispense with the outlet pipe 23, and extend the casing 16 to the top, *to act itself as the conveying channel for the liquid.* In each case, of course, *the pump casing 21 and platform 61 will be made water-tight within the casing 16,*

and for this purpose the wedges 62 will be made in overlapping sections, in order to break the joints seen in Figure 12. The pumps will then deliver directly into the upper casing." [Patent, p. 2, ll. 115-130 and p. 3, ll. 1-4.]

These co-operating wedges 62 would make the "line shaft \* \* \* entirely closed off from the *water in the well*" as specified in the claim, and as distinguished from the *water being pumped* above the platform 61. The co-operating wedges come within the meaning of this descriptive phrase and not the closed shaft casing expressed as an element in fifteen other claims, and at law *presumably intentionally omitted from this claim*.

The fifteen claims including the shaft casing describe it in the following language:

"1. A pump provided with a closed driving shaft casing extending to the top of the well from the pump \* \* \*."

"2. A pump provided with a closed driving shaft casing extending to the top of the well from the pump \* \* \*."

"4. \* \* \* and protective casing for the shaft \* \* \*."

"5. \* \* \* a sectional pump shaft casing surrounding the pump shaft and extending to the top of the well \* \* \*."

"9. \* \* \* a closed casing surrounding the pump shaft from the pump to the top of the well."

"10. \* \* \* and a closed shaft casing \* \* \*"

"11. \* \* \* a closed shaft casing protecting the bearings from the water \* \* \*."

"12. \* \* \* of a casing for a pump shaft \* \* \*."

"13. \* \* \* of a sectional casing therefor (the actuating shaft) \* \* \*."

"14. \* \* \* of a pump shaft casing closed at the top and bottom \* \* \*."

"15. \* \* \* and a closed casing around the shaft."

"17. \* \* \* and shaft casing surrounding the shaft, the shaft and casing being in sections and connected by bearings at each end \* \* \*."

"19. \* \* \* a closed pipe \* \* \*."

"21. \* \* \* and a shaft casing entirely enclosing the shaft and bearings."

"22. \* \* \* and shaft casing \* \* \*."

In *Duncan v. Cincinnati Butchers' Sup. Co.*, 171 Fed. p. 663, the court said:

"\* \* \* where the applicant for a patent in one claim makes no mention of an element, and in another includes it, the presumption is that he omitted it in the first on purpose."

The claim has been hitherto misconstrued. It does not include a "closed shaft casing" at all, but was designed to cover the modified form of wedges the same as claim 2.

Claim 2 describes the wedges as:

"means for fixing the pump at any desired point in the center of the well casing and *sealing said shaft off from the water in the well.*"

Another claim was proposed to cover these annular wedges with the function of making the pump casing 21 and platform 61 water-tight within the casing 16. (Patent p. 3, 11, 1-4.) That was claim 24, which was rejected.

It read:

"In well apparatus the combination of a pump, a casing therefor, means for fixing the

pump in predetermined desired position and means *whereby water is prevented from passing between the casing and the pump into the well.*" [R. p. 975.]

Before amendment claim 22 contained the following language:

"\* \* \* a shaft casing, and a discharge outlet from the pump independent of the shaft casing and *scaled off from the well casing below the pump.*" [R. 981.]

It may be noted in passing that the well casing is not suspended, nor does it hang pendant from the top of the well, but is the wall of the well.

Generally speaking, the well casing and discharge casing are separate elements.

The discharge casing is specifically covered in claim 22, which speaks of it as "a discharge outlet from the pump independent of the shaft casing."

Claim 20 cannot by any possible stretch of the imagination include a concentric discharge casing hanging freely within the well casing.

Nothing in the patent suggests such a combination. In fact, the whole teaching of the patent is to lead away from such a device. The wedges, sliding collars and rods tend to keep the mind to the old side discharge pipe. There were no means then known of aligning the shaft casing within a concentric discharge casing.

The well casing as a discharge casing is not in any way the equivalent of the modern con-

centric discharge casing which hangs freely within the well casing and carries the shaft casing within and the pump below, *devoid of any of Layne's patented wedges.*

The well casing has no block and strap arrangement to bind it at intervals to the shaft casing. The well casing is not assembled with the pump mechanism for insertion unit by unit within the well, but lines the well hole to preserve the formation.

Its function in claim 20 is "to act itself as a conveying channel for the liquid" in combination with the annular wedges making the platform 61 water-tight. [Patent, p. 2, ll. 124-130.]

(2) *The rotary pump* is not peculiar or novel, but simply an old element in a combination claim. The only limitation of the pump in this claim is the word "therein," which refers to a well casing, that is, the rotary pump is in the well casing. The fact that it is stated as being in the well casing must have some significance, and this brings us again to the conclusion that the rotary pump in the well casing was intended to co-operate with the well casing in order to raise and discharge the water.

(3) *A line shaft* is also an old element and in an old combination, to-wit, a rotary pump within a well casing.

It should also be noted that the line shaft of the Layne patent is not suspended, nor does



it hang pendant from the top of the well, but each section is *independently supported* by means of the thrust bearing and collar.

One of the patent's objects is:

"to provide an extensible pump shaft separately supported at intervals along its length." [Patent, p. 1, ll. 35-37.]

The specification reads:

"The weight of the shaft and pump below the block 47 is carried by the block 48; and from Figure 8 it will be seen that a similar arrangement is made at the top of the next section of the shaft casing, where the block 47' supports the weight of the section of shaft 39' by means of the collar 48', connected by a pin and key as before." [Patent, p. 2, ll. 49-57.]

"It will be noticed that the weight of the pump and its shaft is supported at each end of the sections of the casing by the blocks 47, 47', etc." [Patent, p. 2, ll. 97-100.]

Claim 20 does not indicate any novelty in the line shaft as such. It does not specify the patent's separate supports nor the shaft's extensibility.

If there is any novelty in the claim it is not in the elements so far discussed, to-wit: the well casing, the rotary pump and the line shaft—nor in these three old elements in this old familiar combination.

If there be any novelty in the combination it must be from something read into the claim by reason of the clause describing the line shaft as "entirely closed off from the water in the well."

If this phrase indicates the means of sealing the pump casing and platform in the well casing so as to make the well casing operate as the water discharge conduit, there is a novel combination, to-wit: a rotary pump and line shaft in combination with wedges, sealing said line shaft off from the water in the well, thereby making the pump casing and platform watertight, whereby the well casing can be used as a water discharge conduit.

Examination of all the other claims containing the element "the well casing" shows that the well casing always co-operates with wedges to make an operative mechanism of the combinations covered by the claims.

From the claims including the well casing we quote the following language:

"1. \* \* \* means for fixing the pump at any desired point in the well casing, substantially as described."

"2. \* \* \* means for fixing the pump at any desired point in the center of the well casing and sealing said shaft off from water in the well, substantially as described."

"5. \* \* \* means for fixing the pump in position at any desired point of the well casing."

"7. In combination with the well casing and a pump, a series of wedges suspended by rods from the top of the well for operating the same *to wedge the pump casing against the well casing*, substantially as described."

"8. In well mechanism a pump casing provided with a series of wedges mounted upon toggle links therein *to wedge the said casing against the side walls of the well casing*, substantially as described."

"12. In pump mechanism the combination of wedges for fixing the pump in the well casing, of a casing for the pump shaft, \* \* \*."

"18. \* \* \* \* and devices for fixing it (a pump) at any desired point in the well casing \* \* \*."

"21. The combination of a well casing, a rotary pump therein, means for fixing it at any desired point. \* \* \*"

"22. The combination of a well casing, a rotary pump therein, means for fixing it at any desired point. \* \* \*."

It is clear from the above claims that the function of the well casing is to furnish a solid wall against which the wedges may operate to wedge the pump casing in order to center and fix it in position at any desired point.

Claims 21 and 22 begin exactly in the same language as claim 20: "the combination of a well casing, a rotary pump therein \* \* \*."

Claims 21 and 22 continue: "means for fixing at any desired point."

Whereas claim 20 emphasizes the other functions of the wedges stated in claim 2, "sealing said shaft off from water in the well," claim 20 reading:

"a line shaft for the pump entirely closed off from the water in the well."

What other function can the well casing have? How can it co-operate with the pump or shaft, either jointly or successively, except in combination with the wedges, either in the preferred or modified form?

Unless claim 20 be construed, as above contended by us, namely to read only on the modified form of figures 10 to 13 with the outlet pipe 23 dispensed with and the discharge of water up through the well casing, such claim 20 is obviously for a mere aggregation of elements as the well casing could in no manner co-operate with the other elements, "a rotary pump therein, and a line shaft for the pump entirely closed off from the water in the well."

The claim to be valid must be for an operative combination, and there cannot be read into it an element (the shaft casing) found in other claims, especially when that element has no co-operation with the others, and could not with them constitute an operative device.

Claim 20 with a shaft casing read in, does not form an operative combination, for the well casing has no co-operative function in such a combination.

In *Wilson v. McCormick Harvesting Mach. Co.* (7th C. C. A.) 92 Fed. 174, the court said:

"If a fulcrum cannot be supplied by implication, the claim is perhaps void, because it does not show an operative device; but that the hinge-bar, F, expressly included in the second claim, cannot be read into the third, where it is not mentioned, seems to be clear."

In the case at bar, if the concentric wedges (to co-operate with the well casing to operate as a water discharge conduit) cannot be sup-

plied by implication the claim is void, "because it does not show an operative device"; and the shaft casing, expressly included in fifteen other claims, cannot be read into claim 20 where it is not mentioned.

The following language of the opinion in *Doubleday v. Roess*, 11 Fed. 739, involving, as here, an apparatus for deep wells, is very pertinent if the claim be construed to include the shaft casing:

"What, then, have we in this case but a mere bringing together of old devices without any new and useful result being produced by their co-operation? That such a combination is not patentable is well settled. *Hailes v. Van Wormer*, 20 Wall. 353; *Reckendorfer v. Faber*, 92 U. S. 357.

"The result produced, it is said in *Pickering v. McCullough*, 21 O. G. 75, must be due to 'the joint and co-operating action of all the elements,' otherwise it is only mechanical juxtaposition and not a vital union, *Id.* I think the present is clearly a case of the mere aggregation of devices within the principle of the authorities cited."

For comparison we quote below claim 20, reading in the shaft casing and again quote it reading in the concentric wedges. The first is a mere aggregation of old elements, the second a combination of co-operative elements.

"The combination of a well casing, a rotary pump therein, and a line shaft for the pump entirely closed off from the water in the well," by a shaft casing.

"The combination of a well casing, a rotary pump therein, and a line shaft for the pump entirely closed off from the water in the well," by a series of co-operating wedges enabling the well casing to act as a conduit for the water.

Claim 20 has not been construed as we have above contended but the phrase, "entirely closed off from the water in the well," descriptive of a function of the shaft casing, has been held sufficient to read that element into the claim. And not only has the shaft casing been read in, but also intermediate bearings, and other elements and means to create functions not expressed in the claim.

A comparison of plaintiff's counsels' conception, stated in their own words, and the language of claim 20 in conjunction with the specification of the patent shows that the patent and claim have been stretched beyond all bounds.

#### **Plaintiff's Counsels' Conception Compared With Claim. 20.**

Plaintiff's counsels' conception of what Mr. Layne invented and embodied in his patent and covered by the claims in suit, is set out on page 6 of his petition for *Certiorari* and repeated on page 34 of his brief therewith.

We quote same below in one column and in the second column give the language of claim 20, with descriptive matter from the patent's specification.

It will readily be seen that plaintiff's counsel has substituted his own conception of what

Layne might have invented for what his patent actually discloses, that he has omitted several features stressed by the patent and added others not covered by the claim.

*Claim 20*—"The combination of a well casing, a rotary pump therein, and a line shaft for the pump entirely closed off from the water in the well."

*Plaintiff's Counsels' Conception.*

"Mr. Lavne invented his deep well pump mechanism, adapted to be assembled, *unit by unit*, at the mouth of the well bore and be successively lowered therein a *unit's length* after the addition of each succeeding unit.  
(Counsels' italics.)

*Claim 20 and the Patent.*

Claim 20 does not involve means or method of assembly.

The patent specifies, not *unit by unit* method of assembly, but:

"The *whole* apparatus being self-contained, can be put together in proper form and lowered into the well *at once*." (Patent, p. 3, ll. 66-69.)

"In order to *previously assemble* all the parts and then put the pump into the well and fix it in position therein, I provide a system of wedges 33," (Patent, p. 2, ll. 1-5.)

So also supporting the shaft *weight* in sections (Patent, p. 2, ll. 100-105) is specified in connection with assembly.

"and, when completely assembled and lowered, to *hang pendant* from the surface, like a plumb bob:" (Counsels' italics).

Said mechanism consisting of, in combination:

(1) a *pump* attached to a *sectional line or power shaft* extending to the top of the well; (Counsels' italics).

(2) A *pump* casing inclosing the pump impeller; (Counsels' italics).

(3) "A *water discharge, sectional casing* connected to the pump casing and through which the pumped water passes to the top of the well;" (Counsels' italics).

Claim 20 does not involve suspension.

The patent's wedged in pump is the anthithesis of *hanging pendant* like a plumb bob. A plumb bob is not "mounted" on wedges (Patent, p. 1, ll. 72-74), nor is it "fixed in place" and "held in proper vertical position" by a "system of wedges," as provided in the patent. (Patent, p. 2, ll. 4-7.)

Claim 20. "The combination of \* \* \*

Claim 20. "\* \* \* rotary pump therein, and a line shaft for the pump \* \* \*

The claim does not describe the shaft as sectional though a number of other claims stress this feature.

Not in claim 20.

Claim 20. "The combination of a well casing \* \* \*."

If the well casing is to be considered as the means "through which the pumped water passes to the top of the well" then the



*Plaintiff's Counsels'  
Conception.  
(Continued.)*

*Claim 20 and the  
Patent.  
(Continued.)*

claim includes a water discharge casing. In such case the concentric wedges 62 must be used to make the platform 61 water-tight and prevent the water being pumped from flowing back into the well. (Patent, pp. 1, 2, ll. 129-4.)

If this be the meaning of the claim then the concentric wedges 62 are also the means whereby the line shaft is "entirely closed off from the water in the well," as distinguished from water being pumped, and the shaft casing is not included.

It should be noted in passing that the well casing is installed prior to assembly of the pump and hence is not part of the assembly "unit by unit" described by plaintiff's counsel, nor does it "hang pendant," but is the wall of the well.

Within this stationary well casing is inserted the well mechanism.

It is in no sense the equivalent of the modern concentric water discharge casing, which is not suggested by Layne's patent showing a *side water discharge*.

(4) "*A sectional shaft enclosing casing, extending from the pump casing to the top of the well and said shaft enclosing casing being adapted to:*" (Counsels' italics).

Claim 20. "and a line shaft for the pump entirely closed off from the water in the well."

The shaft casing is not mentioned in claim 20 but in 15 other claims all specifically using the word "casing," except claim 19 which speaks of it as a "closed pipe."

There was no necessity of reading the shaft casing into claim 20, especially as there are other means which might as well be considered as closing off the shaft from the water in the well, such as the side discharge casing in combination with the stuffing box at the top of the pump bowls, or the concentric wedges 62 made with overlapping sections in order to break the joints and make the platform 61 water-

*Plaintiff's Counsels'*  
*Conception.*  
(Continued.)

"(a) hold in *aline-*  
*ment* the line shaft by  
means of suitable  
*bearings* within said  
casing at appropriate  
intervals:" (Counsel's  
italics).

"(b) to *protect* the  
line shaft and its bear-  
ings from wear or in-  
jury by any sand, grit  
or other bearing de-  
stroying detritus car-  
ried by the water be-  
ing pumped, and"  
(Counsel's italics).

*Claim 20 and the*  
*Patent.*  
(Continued.)

tight within the casing  
16. (Patent, pp. 2, 3,  
ll. 124-4.)

Neither the word  
"*alignment*" nor any  
of its synonyms ap-  
pear anywhere in the  
patent.

The patent states:

"I provide a system  
of wedges 33, which  
serve to fix the pump  
in place and hold it in  
proper vertical po-  
sition \* \* \*." (Pat-  
ent, p. 2, ll. 5-7.)

*Bearings* are not  
mentioned in claim 20,  
but are mentioned spe-  
cifically in claims 10,  
11, 13, 15, 16, 17, 18,  
19 and 21.

Claim 20, "entirely  
closed off from the  
water in the well."

Claim 11 claims this  
protective function for  
the shaft casing read-  
ing in part:

"A closed shaft cas-  
ing protecting the  
bearings from the  
water."

Sand, grit and de-  
tritus are not men-  
tioned in the patent.

“(c) to form a *conduit for lubricant* from the top of the casing down through each succeeding bearing, including the lowest bearing, thus lubricating all the bearings *in series.*” (Counsels’ italics.)

The patent does not describe the casing as a “conduit,” but on the contrary specifies that it is a “chamber” nor is there any suggestion of lubricating the bearings in series, but on the contrary by a “chamber” “kept filled” with clean liquid, stagnantly held therein.

Lubrication of bearings appears in claim 19, reading:

“A pump shaft made in independently supported sections and suspended in a closed pipe and provided with bearings and means for lubricating same.”

Lubrication is not involved in claim 20, for it does not state any lubricating means as does claim 19 above quoted.

### Elements Added by Plaintiff's Counsel, Not in Claim 20.

It will be seen from the above that plaintiff's counsels' conception includes the following elements not included either expressly or impliedly in claim 20.

- (1) Assembly means.
- (2) Suspension means.

(3) A water discharge sectional casing, unless the well casing 16 be so considered. In that case another element, not expressed, is required to make it operative, to-wit: the co-operating wedges of the modified form of structure;

(4) A sectional shaft enclosing casing, unless improperly read in as a means to make the line shaft "entirely closed off from the water in the well," which could not include any other function of said casing, the casing itself not being mentioned, and if improperly read in producing a mere purposeless aggregation.

(5) Bearings.

(6) Alignment.

#### (1) Assembly Means.

One of the objects of the patent is "to provide means by which the piping and pump may *all* be assembled in proper shape *before* inserting it into the well." [Patent, p. 1, ll. 12-15.]

This was accomplished by the wedge system.

"In order to *previously assemble all* the parts and then put the pump into the well and fix it in position therein, I provide a system of wedges, 33," etc. [Patent, p. 2, ll. 1-5.]

By supporting the weight of the shaft in sections, the pump shaft and shaft casing can be made in separable sections "and *the parts assembled before* putting them in the well." [Patent, p. 2, ll. 100-105.]

"The whole apparatus being *self-contained*, can be put together in proper form and lowered into the well *at once*." [Patent p. 3, ll. 66-69.]

Under the old pit pump system it was necessary for a man to go down into the pit to fix the pump in place. Layne conceived that he could obviate this by a system of wedges 33, "avoiding the necessity of a man's going into the well in order to fix the pump in place." [Patent, p. 2, ll. 8-10.] He also provided links, collars and rods 27 and 30, extending to the top of the well, "in order to manipulate it without going into the well." [Patent, p. 2, ll. 27-28.]

The unit by unit method of assemblage was not invented by Layne, but was originated before Layne by Byron Jackson.

In Byron Jackson's contract with Pabst for the installation of the 1903 Pabst pump is the following provision [Mead ex. 37, R., p. 147.]

"The said second party also agrees to furnish at his own expense a suitable derrick to place over the well at satisfactory height to raise each section of pump and pipe one over the other, each section not to exceed twenty (20) feet; requiring the top of the derrick to be, approximately, 40 feet high."

Alvord, who was also prior to Layne, used the unit by unit method of assemblage in connection with his aligning braces 16 (Fig. 1). [R., p. 930.] His shaft and shaft casing were made in sections. [R., p. 932, ll. 53-56.]

Both the El Campo and Getty mechanism were capable of assembly unit by unit. They were held not to infringe either claims 9 or 20. [195 Fed. 83, 262 Fed. 141.]

If the method of assembly is important in measuring Layne's conception, then the wedges, and the thrust bearings sectionally supporting the weight of the shaft, should be given due consideration.

Layne's system was not a unit by unit method of assembly, but assembly of all the parts before inserting into the well. In order to previously assemble in proper form and put into the well at once, he provided his system of wedges.

There is nothing in the patent, and particularly nothing in the claims in suit which suggests such a unit by unit method of assembly.

## (2) Suspension Means.

Claim 20 does not include suspension means from the top of the well, though such means are expressly covered by rejected claims 1, 2 and 21 of the patent, and in present claim 18, which reads:

"18. In well apparatus the combination with a pump and *means for suspending it from the top of the well*, of a casing separating the pump and bearings from the well, and devices for fixing it at any desired point in the well casing, and means for operating the fixing devices from the top of the well." [R., p. 1005.]

Here is the idea of suspension and wedges combined. So also in the rejected claims, suspension means and wedges are combined.

Layne's attorney in writing the patent examiner, explained this idea as follows:

(P. 981) "The patent to Crannell not only shows a pump which cannot be *fixed at any desired point in the well* and which does not operate directly upon the water to raise it through an independent shaft (the side discharge casing 23), \* \* \*"

\* \* \* \* \*

(P. 983) "In fact none of the references show a closed driving shaft casing which extends to the top of the well from the pump and means to fix the pump in the well casing. THESE TWO FEATURES ARE NECESSARILY COMBINED because the essential thing of the invention is the drawing up of the water from below the pump and discharging it through an outlet (the side discharge casing 23) which is independent from the casing enclosing the bearings, whereby the bearings are entirely protected from the flowing water." (Small caps, parenthesis and italics ours.) [R. 981, 983.]

*Layne's wedge system was intended to replace the well bottom of the pit pump as the support for pump.*—What Layne did was to devise a system of wedges to fix the pump in place and hold it in proper vertical position, designed to be operated from the top of the well. Thus he planned to support in a driven well a pit pump, not of the old type with bearings on a framework, but of the Crannell type, which had a closed shaft casing.



*Layne's main idea* is thus expressed in the patent:

"My invention relates to the apparatus used for drawing water from driven or Artesian wells, and particularly to the *means for adjusting a pump therein.*" [Patent, p. 1, ll. 8-12.]

This was accomplished by his

"system of wedges 33, which serve to fix the pump in place and hold it in proper vertical position, designed to be operated from the top of the well \* \* \*." [Patent, p. 2, ll. 4-8.]

By operation of the collars and links, he thought wedge blocks 35 might be made

"to press with great power against the wedges 33, and thus fix the pump casing in place wherever desired." [Patent, p. 2, ll. 32-35.]

"The wedge system illustrated for tightening the pump casing in place may also, if desired, be used to center it with respect to the casing." [Patent, p. 2, ll. 105-108.]

In figures 10 to 13 the patent shows

"a modified form of apparatus which uses a simple series of wedges for fixing the pump in place, as illustrated best in figure 11." [Patent, p. 2, ll. 113-115.]

About two-thirds of Layne's stated objects and half his claims are to cover the wedge system.

Layne's mechanism is designed to be raised or lowered and held in proper vertical position by the wedges. [Patent, p. 2, ll. 1-10.]

The wedges automatically center the pump, though they may be manually operated.

"It will be seen also that the toggle levers used for actuating the wedges may be used

or not, as desired since the wedges alone will be amply sufficient in the apparatus of figure 1, as well as that of figure 10." [Patent, p. 3, ll. 69-73.]

The District Court in the instant case says:

"The problem of the inventor was not a new type of pump or pump runner, but, broadly speaking, how to install an existing rotary type—preferably centrifugal—operate it, withdraw it for repairs, and replace it *without the necessity of a man entering the well.*" [R. 889.]

The patent gives the solution—by a system of wedges 33,

"designed to be operated from the top of the well, *avoiding the necessity of a man's going into the well* in order to fix the pump in place." [Patent, p. 2, ll. 7-10.]

Plaintiff's counsel have asked: "How could he construct and assemble on the ground a pump structure of the necessary great length " etc.

The patent answers:

"In order to previously assemble all the parts and then put the pump into the well and fix it in position therein, I provide a system of wedges 33," etc. [Patent, p. 2, ll. 1-5.]

As stated above, about two-thirds the stated objects and half of the claims of the patent are to cover the wedge system.

Only one stated object refers to the shaft casing.

"to provide for mounting the pump and shaft in a closed casing open to operate from the top." [Patent, p. 1, ll. 38-41.]

This evidently refers to the blocks in the shaft casing supporting the shaft in sections with pump attached to the lower section, the casing being open at the top to insert hollow rod 44 to operate the means for tightening the packing in stuffing box 40, and pipe 52 to force in air to force out fluid.

Chiefly, the objects of the patent are adjustment, fixation, and centering obtained by the wedge system.

**The Main Idea of the Patent Is Adjustment by Wedges in a Driven or Artesian Well of a Pump Therein.**

The shaft casing was attached to the pump casing. Inside the shaft casing at the end of each section were bearing blocks to support the various sections of shaft, with pump impellers attached to the lowest section. On the outside of the shaft casing were collars attached to rods to operate the wedges attached to the pump casing below. Then the whole apparatus, thus self contained, was lowered into the well at once, adjusted, centered and fixed therein by the wedge system.

The wedge system is the essence of Layne's invention.

Claim 1, 2, 3, 4, 5, 6, 7, 8, 12, 18, 21 and 22 and original claims 1, 2, 9, 21 and 24 all contain wedges as an element. Of these seventeen claims including wedges, twelve are of the

twenty-two allowed. The other claims cover details of the construction used with the wedge system.

*Layne's Modified Form of Structure* shows that the wedge system was Layne's main idea. Figs. 10-13, inclusive, illustrate a different *wedging system*, concentric annular wedges.

The patent itself so states:

"In figures 10 to 13 I have shown a modified form of the apparatus which uses a simple series of wedges for fixing the pump in place, as illustrated best in Figure 11." [Patent, p. 2, ll. 112-115.]

Fig. 10 shows a short section of shaft casing 60, terminating below the pit at 68. From the drawing the timber 56 is not distinguishable from the shaft casing 60; but by reference to fig. 13 it is shown that shaft casing 60 terminates at 68, and above that figure is the timber 56, so marked in fig. 10. This old-style framework suspends the shaft and shaft casing in the well, supported additionally at the bottom by the annular wedges.

Shaft casing 60 is closed at the top with stuffing box 71, but no opening is shown for lubrication, and no means of lubrication is apparent. Evidently water lubrication from below was intended.

Only one length of discharge pipe is indicated, and only one length of shaft. We are left to imagine upper bearings attached to the timber 56, to keep the shaft in alignment above

the casing 60, between stuffing box 71 and the pulley head.

*Preferred and Modified Forms Compared.—*

Concerning the modified form of structure, the specification of the patent contains the following language:

"In general I prefer the form of apparatus as shown in Figure 1, both because the means for fixing the pump in place is more easily adjusted, and because of the superior mounting of the pump shaft inside its sectional casing as therein shown, and making the pump shaft in sections. But in cases where the pump will not be moved for a long time, the device of Figure 11 may be used for wedging it in place." [Patent, p. 3, ll. 50-60.]

Analyzing this statement, it appears that the "means for fixing the pump in place," to-wit: the wedges, as shown for the more approved form of apparatus shown in fig. 1, "are more easily adjusted" because of the sliding collars and toggle mechanism, while in the other form of construction the "screws 65 may be operated by means of a socket wrench placed upon a long rod, \* \* \* or may be extended to the surface of the ground \* \* \*." [Patent, p. 3, ll. 9-14.]

The statement as to the "superior mounting of the pump shaft inside its sectional casing as therein shown" evidently refers to the thrust bearings. The only bearing described in the modified form of structure is one, not for the

shaft, but for the shaft casing where the statement appears:

"Extending downward from the beam 57 may be provided a timber 56, and part way down a bearing and support provided for the casing of the pump shaft 60, by means of the block 67, which is carried on a cross frame 68; and a packing box therein, 71, is closed by a screw 70, the whole being attached to the timber 56 as shown in Figure 13. Below this point the shaft 39 may be inclosed in the casing 60, which is screwed in the block 67, as shown in said Figure." [Patent, p. 3, ll. 19-28.]

According to the statement under analysis, the phrase, "and making the pump shaft in sections," is intended for the preferred form of construction, but not for the modified form.

As no bearings are shown in the modified form of structure and as there is no provision that the pump shaft is to be made in sections, though "the casing 60 may be in sections and of any desired length" [Patent, p. 3, ll. 32-33] and, further, as no very long rod with socket wrench could be used to tighten screw 65, the evident intent of the modified form of structure is for a shallow well with one length of shafting and no bearings within the shaft casing.

*The only purpose of the modified form of structure was, therefore, to show for the ever-essential wedging system a different form of wedging than that used in the preferred form of structure.*

*The concentric annular wedges* of the modified form of structure have, however, an additional function to that of those shown in the preferred form. These wedges were designed to make pump casing 21 and platform casing 61 water-tight within the well casing 16, and by this means the well casing itself could be used as the conveying channel for the water, and the pump would then deliver directly into the upper casing. [See Patent, pp. 2, 3, ll. 124-4.]

This modified form of structure in figs. 10-13 embraces Layne's main conception as disclosed in the patent of a *wedge-adjusted* closed shaft casing *pit* pump, but does not embody the elements and features claimed by plaintiff to be embraced in Layne's alleged generic invention.

No *lubrication* means are indicated.

No *shaft bearings* within the casing for alignment are shown, but the old *pit* pump method of *alignment* by means of beams and framework is used.

No *protection* means are shown.

There is no block and strap arrangement binding discharge pipe 23 and shaft casing 60 together, but the discharge pipe is attached to the framework of timber 56 by strap 69 attaching block 67 to timber 56. [Patent, p. 3, ll. 29-32.]

Evidently the only purpose of the modified form of structure was to emphasize Layne's

main idea—his *wedging* system, in such a particular form as also to entirely close off the line shaft above the wedges from the water in the well. This function is expressed in claim 20.

In Layne's structure, suspension required *wedges*.

One reason why the suspension of a well mechanism in a deep well was considered by Layne to require the use of wedges to hold the pump in proper vertical position was because the casing of a deep well of that period was usually slightly crooked or sinuous. This is the reason why Alvord devised his means for aligning, as he stated in patent (prior to Layne) 735,690, page 1, lines 18 *et seq.* [R. 932.]

The principal reason for wedges, however, was that, with the discharge pipe on one side, the weight is not then equally distributed and it would be absolutely necessary for the pump to have further bracing. The pump could not hang freely within the well casing unless the water were to discharge directly into the center around the shaft and thus balance the contrivance.

The correspondence between Peden Iron and Steel Co. (with which Mr. Layne was associated at the time), and Byron Jackson Machine Works shows the state of the art when Layne filed his patent application.



In a letter from Peden Iron & Steel Co. to Byron Jackson Machine Works, dated March 7, 1903, appears the following \* \* \* [R. 873]:

"We herewith inclose a sketch showing, in our opinion, what might be possible in the way of designing a top discharge for a centrifugal pump. In this sketch you will notice that we have an under suction and a top discharge; the propellor discharges into an opening directly over same and *conveys to one side* [R. 874] *of the shaft to discharge pipe* in place of following around the pump and discharging in the usual manner on the side. \* \* \*

In your judgment would we need further stay the pump in the pit other than by being braced to the shaft and post suspending the pump?"

On April 2, 1903, Byron Jackson Machine Works wrote to Peden Iron & Steel Company as follows [R. 877]:

"We hand you herewith sketch showing an 8" vertical pump with 18" runner which we think will just fill your requirements. You will notice that we have split the discharge end in two. We did this in order to hang the pump centrally, *so it will not require any further bracing which would be absolutely necessary if the discharge were on one side as the weight is then not equally distributed.* The pump as we have shown it is intended to be lowered into a pit and it can be hung on the two pipes."

Suspending a closed shaft casing *with wedges* is no advance over the prior art because admittedly without utility. It was never used.

It is significant that the patent itself does not mention free suspension or pendency like a plumb bob. Suspension means are mentioned in only one claim, and then in connection with the *wedges*. Three other claims mentioning this feature were rejected, and that rejection acquiesced in. They also included *wedges*.

None of the claims in suit include or involve free suspension as did the earlier 1902 Byron Jackson structure.

In the Ninth Circuit Court of Appeals opinion the court says (p. 468):

"In claim 18 the combination includes 'a pump and means for suspending it from the top of the well.' The plaintiff claims that by this suspension the pump hangs pendant from the top of the well like a plumb bob in the well cavity, and that the shaft casing will also so hang and thus hold in alignment the shaft bearings mounted within the casing, and thereby maintain the shaft in alignment. But we do not find any claim for this suspended structure either in claim 9, 13 or 20, and there is no charge that claim 18 has been infringed."

(P. 469):

"This means for suspending the mechanism is to operate on the shaft casing and not the shaft casing upon the means of suspension, and this suspending device for alignment provided for in claim 18 is no part of this controversy."

*Western Well Works v. Layne & Bowler Co.*, 276 Fed. 468, 469.

**(3) Water Discharge Sectional Casing.**

A concentric discharge casing independent of the well casing is not contained in claim 20. It is not in the patent at all. It is the structure invented by Byron Jackson and adopted by the art, including Layne.

**(4) A Sectional Shaft-enclosing Casing.**

This is another element that has erroneously been read into claim 20. Plaintiff's counsel are, however, justified by the prior adjudications in reading this element into the claim. This error may now be corrected as the prior adjudications are before this court for review.

Claim 20 describes the shaft as "entirely closed off from the water in the well." This might have been accomplished (1) by the concentric wedge 62, as we have above shown, or it might have been (2) by reason of the use of a side discharge pipe and a stuffing box at the top of the pump bowls, or it might have been (2) by the shaft casing, or it might have been (4) by all these elements in combination.

In view of the specifications we urge that the claim is too indefinite, too ambiguous to be sustained.

In *Hjarne v. American Voting Mach. Co.* (D. C. Mass. 1914), 212 Fed. 439, the claim related to key spindles and the means for regulating or controlling their rotation in a voting machine. The court held the claim fatally de-

fective for indefiniteness because of the difficulty of determining from the claim which of the things mentioned as elements of the combination claimed were intended to be described as permitting the key-spindle to be turned back at any time before the machine was set for the next voter.

See also:

*In re Blackmore*, 32 App. Cas. (D. C.) 338.

### (5) Bearings.

Claim 20 does not mention intermediate or any bearings nor their function—alignment. Bearings are not included either expressly or by implication.

An examination of the specification shows bearings inserted as blocks supporting thrust collars, at the end of each section of shaft casing, as expressed in claims 10, 13, 15 and 17, but not in claim 20.

These bearings consist of two parts, a bearing block 47' which contains an opening serving as a sleeve for the shaft, and above and resting on this block is a collar for the shaft, the thrust collar being designated as 48'. This thrust collar 48' caps the slight annular space between the shaft and the sleeve bearing, thus stopping the oil working down and holding it in a chamber.

The main function of these bearings is to support the weight of the shaft in sections.

(Patent p. 2, ll. 49-57.) This feature is expressed in claims 3, 10, 15, 16 and 17.

These bearings are held in place by the shaft casing, which in turn is fixed and held in proper vertical position by "a system of wedges 33" (Patent p. 2, ll. 5-7) and also "mounted by a modified method on a series of co-operating concentric wedges, as shown in Fig. 11." (Patent p. 1, ll. 72-74.)

If the wedges in Layne's construction, as described and illustrated in his patent, were removed the shaft casing would not only be thrown off balance by the side discharge pipe and the side thrust of the water but would also whip with the motion of the revolving shaft.

The bearings would not align the shaft unless themselves held firmly in place. If the shaft casing did not align the bearings then the bearings in turn would not align the shaft and the shaft casing would not have the function of alignment.

#### **(6) Alignment.**

Layne did not conceive that the shaft casing by itself would be sufficient to align the shaft or bearings, without the aid of wedges to hold the casing itself in vertical position.

The specification above mentioned speaks of the wedges as serving "to keep the pump in place and hold it in proper vertical position." (Patent p. 2, ll. 5-7.) They may also be used to center it. (Patent p. 2, ll. 105-108.)

The shaft casing in combination with the wedges is specifically mentioned in claims 1, 2, 4, 5, 12, 21 and 22.

The patent shows that the shaft casing, by itself, is not a means of alignment by its suspension. Wedges are required.

The only claims suggesting suspension of the pump from the top of the well are rejected claims 1, 2 and 21, and present claim 18, and these claims all specifically mention the wedge as an element.

An analysis of the claims does not show a single claim with the shaft casing in a combination where without wedges it would be used for suspending the pump from the top of the well. The same is true of the specification.

Layne did not plan his shaft casing to be self-aligning. He conceived that an additional means would be required to center and fix it within the well casing, and hold it in vertical position. These were the functions of his wedges.

*The Van Ness and Getty decisions* went too far in their endeavor to support the patent, in stating that Layne's casing had the function of alignment. They did not make any mistake in holding that a shaft casing without the aligning feature was not novel, but in holding that Layne had such a shaft casing. Layne did not conceive, describe or claim it.

In the Getty case the court recognized the part of the wedges in alignment, saying:

“He accomplished its (the shaft’s) adjustment to vertical position in the well hole by suspending the shaft, pump and casing from the top of the well, and by a system of wedges holding the well mechanism in vertical position when adjusted.”

*Getty v. Layne* (C. C. A. 5th Cir.) 262 Fed. 142.

In Layne’s preferred form of structure with the side discharge pipe, *wedges* 33 are used to hold the well mechanism in vertical position when adjusted. But in the modified form, where the specification suggests that the discharge pipe may be dispensed with, and the well casing used as a water outlet, the aligning means are the timber 56, suspending shaft casing 60, and the *annular wedges* centering and fixing it in vertical position.

*No intermediate shaft bearings appear in the modified form of structure, and the shaft casing in the modified form could not have any alignment function.*

The case of *Wells v. Curtis* (6th Cir.), 66 Fed. 318, is one which parallels this case very closely in that, there as here, the function of alignment for a shaft casing, was urged as a new and useful result to distinguish the patent from the prior art, and that, there as here, the modified form does not show this feature of the combination.

The court said (p. 321):

"The advantage claimed for the Forbes patent is that the cylindrical casing performs the function in the combination of furnishing a bearing for the die-carrying ring, and thereby more rigidly holding the die ring to a right line in its forward movement upon the material on which it operates. \* \* \* The *casing in which the shaft* of the ring turned was sufficient, to some extent at least, to hold the die-carrying ring in *alignment* with the object to be threaded, and resist any lateral thrust or twist of the parts from their *alignment* during the operation. The Heap machine included all the elements of the Forbes combination, unless it be that the casing in the latter performed a new function.

Much is said in the testimony and in the briefs of the casing as circumferentially journaling the die ring, and thus contributing an additional function to the combination. But it is difficult to find any indication in the claim, as explained by the specifications, of the discovery of anything new or peculiar in that direction, *or that the patentee intended the casing to perform any such function*. And while it is true that the patentee is not required to point out and describe in express language what he has invented that is (p. 322) new, or the principle of his invention, and that it is sufficient if they can be gathered by implication from what is set forth, yet the implication ought to be clear, so that it may not be left in obscurity and doubt whether the patentee has in reality invented and produced something new. \* \* \*

"In his specifications Forbes says nothing of journaling his die-carrying ring by the casing, which seems singular if he had



such an idea in his mind, for confessedly it was the only new thing in his invention, as he now claims it. \* \* \* If the idea of furnishing a circumferential journal to the die-carrying ring was not present to his mind, but is an after thought perceived from subsequent experience or scientific inspection and analysis, it is obvious that *there was no invention in this by accident, as it were, supplying the means of a function not contemplated.* \* \* \* (P. 323.) But in another part of his specifications, suggesting a modification thereof, he entirely dispenses with this feature of his combination, and transfers it to the inside of the ring and the outside of the sleeve projected from the casing; thus showing that the bringing of the ring and casing in contact was useful in one only of the forms suggested, and therefore not an essential feature. *Trimmer Co. v. Stevens*, 137 U. S. 423, 11 Sup. Ct. 150.

\* \* \* \* \*

“But assuming this function to have been contemplated, it seems difficult to hold that, in view of the prior inventions and constructions in this art, there was any such invention in the provision of this casing as a bearing for the die-carrying ring and its shaft (for that is what the prolongation of the ring really is) as to be worthy to be put upon the plane of new and valuable discoveries, recognized by the patent law.

\* \* \* \* \*

“But, if any defect of that kind existed, it would seem that any skilled mechanic trained in the art of such mechanism ought promptly to have seen the manifest ways for providing a remedy; that is, by making the shaft longer, by making it larger, or, *providing a rest or bearing* for the other

end of the shaft or of the integral member of which it formed a part, and, *if a bearing, that it should be circumferential, in order to meet the indicated requirements.* It is elementary in the law upon this subject that this is not invention."

*Wells v. Curtis*, 66 Fed. 321, 322, 323.

The latter part of the above quotation seems very much like the language of Judge Jack, the district judge who tried the case of *Layne v. Getty*, where he said:

"The insertion of additional bearings to prevent whipping of the shaft where the distance between bearings is too great, is as simple and natural a thing to do as the putting in a fence of extra posts to prevent sagging of a barber wire, where the posts of the panels are too far apart. Were the question a new one, I should be inclined to hold the patent invalid, \* \* \*" [R. 1011.]

With other means essential to align the shaft casing, such as the timber and annular wedges in figures 10-13, or the wedges 33 in the preferred form of structure, the shaft casing does not have the function of alignment.

The *Van Ness* case sustained claim 20, as covering a shaft casing with a *triple function*, attributing to the "protective casing" the additional functions of lubrication and alignment.

The *Getty* case sustained the claim as thus restricted, though in the *Getty* case the court, realizing that claim 20 did not use the terms "closed casing" or "protective casing," or their

equivalent, no longer uses these expressions, but calls it a "closed shaft."

The function of lubrication is one that the specifications describe for a "closed casing."

But neither specifications, drawings nor claims show a shaft casing with the third function called for by the Van Ness case:

"(3) to align the bearings and the shaft so as to prevent lateral displacement in the well and *keep the shaft in vertical position.*" (213 Fed. 808.)

The patent states:

"I provide a system of wedges 33, which serve to fix the pump in place and *hold it in proper vertical position \* \* \**" (P. 2, ll. 5-7.)

*Electric Storage Battery Co. v. Gould Storage Battery Co.*, (2nd Cir.), 158 Fed. 617.

Where a "change or function (alignment) is neither described nor claimed, and especially, where other changes (the wedges, sliding collars, rods and links) are described and insisted upon as essential and specifically claimed, it is significant proof that the change which has not been disclosed by him to the public is not his invention." (Our parentheses.)

In *Union Edge Setter Co. v. Keith*, 139 U. S. 530, 11 Sup. Ct. 621, 35 L. Ed. 264, the court said:

"If any separate function had been performed by this combination, it is somewhat singular that the patentee did not call attention to it in his original application, or

until after the main feature of his patent was shown to have been anticipated."

In *Stirling v. Rust Boiler Co.*, 144 Fed. 849, 852, the court said (p. 849):

"The first and primary duty of a court is to examine the patent and see whether its statements are in themselves plain and self-explanatory, and to resort to extrinsic aid only where it is required to aid in construing it by making plain something not in itself clear and intelligible. Let us therefore turn to the patent itself."

(P. 852):

"If the gist of this invention is the function of those tubes the patentee was singularly successful in ignoring it in his specification, for the only reference to it is where he says, 'the secondary elevated water drum is connected with one of the lower mud drums, preferably the middle one, by means of a series of tubes, etc.' Such omission is not without significance, for, as was said in *MacColl v. Knowles Loom Works*, 95 Fed. 986, 37 C. C. A. 350:

"In the construction of a patent, the omission of the patentee to point out or refer in his specification or claims to the special feature which he subsequently maintains is the most important part of his invention is very significant, and should be carefully scrutinized. 'If this feature be an advantage, as now claimed, it is strange that no allusion is made to it in the specification.' *Fastner Co. v. Kraetzer*, 150 U. S. 111, 14 Sup. Ct. 48, 37 L. Ed. 1019.'"

In *Bates Machine Co. v. Wm. A. Force & Co.* (2nd Cir.), 149 Fed. 221, the court said:

"It is true that a patentee is entitled to all the beneficial uses of his real invention whether stated or not. But the fact that this patentee, while enumerating in his specifications some 12 advantages resulting from his improved construction, has not even hinted at or suggested any resulting capacity for vertical removal of the plunger, is very persuasive that this element, instead of being 'the aim and purpose of the invention' of the patentee is rather the discovery of his expert."

As to undisclosed function see also:

*Goodyear Tire & Rubber Co., et al. v. Rubber Tire Wheel Co.* (6th Cir.),  
116 Fed. 363, 375, 376.

There has been erroneously read into claim 20 the shaft casing as the means of entirely closing off the shaft from the water in the well. In the Fifth Circuit the Circuit Court of Appeals then proceeded to discuss the novelty of the shaft casing as a separate element of the claim and held that the shaft casing with three functions is a novelty, and claim 20 therefore sustainable. Thus both structure and function were read into the claim. This was clear error.

The Supreme Court so holds in *McCarty v. Lchigh Valley Railroad Co.* (160 U. S. 110, 16 Sup. Ct. 240, 40 L. Ed. 358 at page 361) where the court said:

"It is suggested, however, that this feature may be read into the claims for the

purpose of sustaining the patent. While this may be done with a view of showing the connection in which a device is used, and proving that it is an operative device, we know of no principle of law which would authorize us to read into a claim an element which is not present, for the purpose of making out a case of novelty or infringement. The difficulty is that if we once begin to include elements not mentioned in the claim in order to limit such claim and avoid a defense of anticipation, we should never know where to stop. If, for example, a prior device were produced exhibiting the combination of these claims *plus* the springs, the patentee might insist upon reading some other element into the claims, such, for instance, as the side frames and all the other operative portions of the mechanism constituting the car truck, to prove that the prior device was not an anticipation. It might also require us to read into the fourth claim the flanges and pillars described in the third. This doctrine is too obviously untenable to require argument."

There is not a thing in claim 20 which would produce alignment, *because the casing surrounding the shaft could not produce alignment without bearings and wedges and bearings and wedges are not mentioned*. In order to support that patent, it was necessary to read into the claim something that was not there. The court cannot read a function into a claim for any other reason than to sustain its validity, and that that cannot be done unless the element or part as to which that function pertains is specified in that claim.

Plaintiffs are attempting to construe this patent as covering a result—covering a function, covering an object attained. Claims are not for those things. Claims are for structure and the structure is not in claim 20.

It is remarkable that after reading in the means for the *function*, the “shaft casing” for the “entirely closed off from the water in the well,” that the court in the Fifth Circuit expanded the one function into three.

If a shaft “entirely closed off from the water in the well” means one enclosed in a shaft casing which would exclude the water, that does not necessarily or even probably mean that said shaft casing will have any other function than the one of which expression is made. The claim cannot go beyond the function stated, because there is no structure stated which could support any other function.

There is no mention of anything like alignment in the specifications except in connection with the wedges where the specification reads:

“I provide a system of wedges 33 which serve to keep the pump in place and hold it in proper vertical position, \* \* \*” (Patent p. 2, ll. 4-7.)

A third function *alignment*, was read into claim 20 by the Fifth Circuit to sustain it when such function is shown by the patent to be dependent on elements not present in the claim, to-wit, wedges and bearings.

In the Ninth Circuit Court of Appeals opinion the court said (p. 468):

"In the specification we find that one of the functions claimed for this casing is to protect the shaft and its bearings from the water and sand pumped to the surface. Another function claimed is to inclose the means provided for the lubrication of the shaft bearings, but further than this the specification does not go."

(P. 469):

"It seems clear to us that the alignment is not a function of the shaft casing, \* \* \* we are of the opinion that alignment is not a function of any of the elements of either of the claims under consideration."

*Western Well Works v. Layne & Bowler Co.*, 276 Fed. pp. 468, 469.

### **Functionalism of Claim 20 as Construed by Fifth Circuit.**

Claim 20 was construed by the Fifth Circuit to include the shaft casing as a means to entirely close off the shaft from the water in the well. In addition to reading in the shaft casing the court added another element, not expressed, intermediate bearings for the shaft. The modified form contains no suggestion of such bearings. A shaft "entirely closed off from the water in the well" does not, by reason thereof, have intermediate bearings to support it. But the court, to find novelty in the claim, added these bearings to it so that the shaft casing might have the function of align-



ment in addition to the functions of protection and lubrication contained in shaft casings of the prior art, Crannell and others.

This reading in of elements and the function of alignment ignored the silence of the patent on the subject of alignment and the statement that his system of *wedges* was designed to hold the mechanism "in proper vertical position." (Patent p. 2, l. 6.)

To read in function without regard to the means of performing such function is to make the claim functional and void.

*Queen & Co. v. R. Friedlander & Co.*,  
149 Fed. 771, 777.

"Manifestly he seeks to cover more than is suggested in his specification and drawings. In the language of *Carlton v. Bokee*, 17 Wall. 463, 21 L. Ed. 517, he is making 'ingenious attempts to expand a simple invention of a distinct device into an all-embracing claim, calculated by its wide generalizations and ambiguous language to discourage further invention in the same department of industry. \* \* \*' This he cannot do. Claim 1 is therefore held void."

*Cornung v. Burden*, 15 How. 252, 14 L. Ed. 683, 691.

"He cannot describe a machine and then claim the function itself and all other machines that perform the function."

VII.

THE PATENT'S "ENTIRELY CLOSED CASING."

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The Particular Element in Controversy—The Closed Casing.

The claims in controversy, 9, 13 and 20, are combination claims, but the particular element in these combinations which plaintiff desires to exclude others from using is the pipe or tube surrounding the shaft of a rotary pump for water wells. As above stated, it is not expressed in claim 20 but has been read into it.

It is called a "shaft casing" because it encloses or encloses the driving shaft. It is sometimes called an "oil tube" or "oil pipe" because its main function is to hold the oil which lubricates the bearings for the shaft within.

In the patent it is described as an "air-tight chamber" which may be "kept filled with clean liquid" for a "lubricating system." (Patent p. 3, ll. 78-82.) It extends from the pump underground, to the top of the well.

The other elements of the claims limit the combinations in which plaintiff claims the particular kind of shaft casing and its "chamber" purported to be devised by him. The extent to which he may exclude others, if at all, depends upon what advance, if any, he made on the prior art.

Beginning 13 years prior to Layne's filing date, April 29, 1903, there were, with closed shaft casings: The 1890 Crannell patent [R. 1022]; the 1890 *Byron Jackson patent* (Getty Record); the 1894 Eisler patent [R. 1018]; the 1900 Prindle Orpheum Theatre pump installed in Brooklyn, N. Y. (Getty Record); the 1901 Gregory & Snyder pump installed in Louisiana (Getty Record); *the 1901 Byron Jackson's sludge pump* installed in San Francisco, California (a new defense herein) [R. 1114]; the 1901 drawings and disclosures of the Worthington deep well turbine pump distributed through the territory in which Mr. Layne was operating (Getty Record); *the March 5, 1902 blue print and disclosures of Byron Jackson for a three-step centrifugal pump to go in a 16" well 150 feet deep* (a new defense herein) [R. 1063]; the April 7-17, 1902 Alvord's drawings and disclosures incorporated in Alvord's patents Aug. 11, 1903 [R. 929 *et seq.*]; the E. M. Ivins patent of July 29, 1902 [R. 1057]; and (a new defense here) the various drawings and disclosures of early 1903 *of the Pabst pump of Byron Jackson* installed in the latter part of 1903, completed and operated Jan., 1904 and dating back as Byron Jackson's invention to March 5, 1902.

These prior art structures all had shaft casings more or less closed to protect the shaft and its bearings against water and detritus, and

serving as lubrication pipes surrounding said shaft and bearings. Necessarily they limit the scope of plaintiff's patent to the exact combinations disclosed in the patent.

In *Getty v. Layne* (5th Cir. C. C. A.) 262 Fed. 143, the court said as to Layne's patent:

"Its advance over Crannell (patent 1890, R. 1022) prevented Crannell being considered by us an anticipation, and was enough to show novelty, but it stops there. The Layne patent must rest, not upon the idea of closure, which would not be patentable apart from the method by which it was accomplished, but upon the *means* of its accomplishment, as disclosed by the specifications of his patent."

Turning to the patent we find as follows:

### Specification.

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#### ENCLOSING THE SHAFT.

"It (the pump) is attached to a casing 20, which runs to the top of the well and *encloses* the driving shaft 39 of the pump \* \* \*" (Patent p. 1, ll. 100-103.)

"The pump shaft 39 is *enclosed* in a shaft casing 20, which latter is made in joints and may be of any desired length." (Patent p. 2, ll. 36-38.)

#### CLOSED AT THE TOP BY A STUFFING BOX 50.

"At the top, the casing 20 is *closed* and is provided with a *stuffing box 50*, *closed* by the cap 51, at the top of the shaft 39." (Patent p. 2, ll. 57-59.)

#### CLOSED AT THE BOTTOM BY PACKING BOX 40.

"The casing 20 also contains a tubular rod 44, which has a bearing in the block 47 on

top of the pump casing 37, as shown in Fig. 5, and is provided with a square opening which co-operates with the head of the screw 42, used for adjusting the cap 41 of the *packing box* 40 for the pump, and *compressing the packing* in place." (Patent p. 2, ll. 66-72.)

#### KEEPING THE BEARINGS CLEAN.

"This pipe or tubular shaft 44 also serves the purpose of providing convenient means for *forcing* the liquid out of the pump shaft casing. By *forcing* air in at the top of the casing 20, by means of the pipe 52, the liquid can be *forced* down to the bottom of said casing 20, and by means of the small opening 45, in the bottom of the tubular shaft 44, the fluid can be *forced* out at the top 54, and *keep the casing clear in order to leave the bearings clean therein* and not interfere with the working of the pump, or by *forcing* fluid in at the top 54, the operation will be reversed, and the fluid ejected from pipe 52." (Patent p. 2, ll. 83-96.)

#### CHAMBER LUBRICATING SYSTEM.

"I consider it of great advantage also to arrange the pump shaft in a *closed casing* with stuffing box at surface of ground at top of pump, so that by the use of the packing boxes an *air-tight chamber* can be maintained, and water kept out of the casing 20, or *kept filled* with clean liquid, if desired, thereby providing an efficient *lubricating system* for all bearings of the pump." (Patent p. 3, ll. 74-82.)

This last quoted portion of the specifications is the only place where lubrication is mentioned.

The above quotations contain almost, if not all, that the patent contains with reference to the shaft casing.

The language of the patent, the specifications and claims, and especially the claims in contro-

versy, all emphasize the intent to make a tight closure and justify the conclusions in both the Fifth and Ninth Circuit Courts of Appeals that in the Layne patent the shaft casing is *entirely* closed, that there is *complete* closure.

### Adjudications.

The *Western Well Works* decision reads:

"The difference between the Layne patent and the Getty mechanism, as it appears in *Getty v. Layne*, *supra*, is essentially the difference between the Layne patent and the defendants' mechanism in this case. *In the Layne patent the shaft casing is entirely closed*, or that is the invention claimed in claim 20 and is necessarily the operative device of that claim and of claims 9 and 13, and by this device *the oil becomes stagnant* in the bearings and *is blown out* when sufficiently used or spent, while the defendants' shaft is not entirely closed, but permits the oil to circulate down through the bearings and out at the bottom while the pump is in operation." (276 Fed. at top of p. 472.)

Plaintiff's system of lubrication has been well characterized in the Getty case (5th C. C. A.) and the Western Well Works case (9th C. C. A.) as "*stagnant*."

The Layne lubrication system is like that of the crank case of an automobile from which fouled used oil is drained and fresh oil is put in.

There is no oil cup or oil feed indicated or mentioned in the Layne patent as there is in the 1894 Eisler patent, and in the 1890 Byron

Jackson patent where it is described as the part "M", and in the Byron Jackson drawings of 1903 for the Pabst pump.

In the Layne patent the lubricant is not *fed* in but *forced* in as the specifications state. (Patent p. 2, ll. 83-96, above quoted herein.) It then remains "stagnant within the shaft casing until ejected from the top after it had become spent \* \* \*." (Getty case, 262 Fed. 143, Western Well Works case, 276 Fed., top p. 472.)

Plaintiff's specifications describe his closed casing as one which, by stuffing boxes, can be "kept filled with clean liquid, if desired, thereby providing an efficient lubricating system for all bearings of the pump." (Patent p. 3, ll. 79-82.)

As the Layne patent discloses no liquid supply, the closed casing can only be "kept filled" by retaining the fluid therein, that is, keeping it stagnant. If there were any circulation into the well the fluid would be depleted and the casing could not be said to be "kept filled."

So far as the patent discloses, the lubrication "liquid" may have been clean water. The words "oil" or "grease" are not used, merely "liquid."

*Water and Wooden Bearing Blocks.*—Alvord used water and *lignum vitae* bearings for the shaft. [R. p. 932, l. 67.]

Layne's drawings indicate wooden bearing blocks 47, 47'.

Whether water or other liquid were used, the chamber should be "kept filled" for the lubrication of the grinding thrust bearings.

We do not think that the lubricating system described in the patent is efficient or practicable, or that it could be made so without greater modification than is permitted in construing a patent, but we take it *as expressed*. Plaintiff changes the verbiage of the patent from "chamber" to "conduit" in order to present a different picture.

**Layne's Closure Means Are Thrust Bearings and Stuffing Boxes and Sleeve Bearings, All Combined, With a Particular Mode of Operation.**

Figures 7, 8 and 9 of the Layne patent give an interior view of the shaft casing with the top stuffing box 50 and the intermediate thrust bearing block 47' carrying the shaft coupling block 48', and figure 5 shows the lowermost thrust bearings 47 and 48, with the lower stuffing box 40, and a short sleeve bearing below.

It is by reason of these stuffing boxes at the top and bottom of the Layne shaft casing and the thrust bearings, and said sleeve bearings *combined* that Layne has an "entirely closed casing" "so that by the use of the packing boxes an air-tight chamber can be maintained,



and water kept out of the casing 20, or kept filled with clean liquid, if desired, \* \* \*” (Patent p. 3, ll. 77, 78 above quoted.) Thus we see that tight stuffing boxes are essential, as well as the other means.

### **Layne's Lowest Thrust Bearing and Shaft Collar.**

The lowest thrust bearing and shaft collar were present in the Van Ness structure which was held to infringe Layne's claim 20 in the case of *Van Ness v. Layne* (5th Cir. C. C. A.) 213 Fed. 804.

The Getty case speaks of this as follows:

“It is true that in the Van Ness case this court stated that Van Ness used the pressure of the oil column, and did not use packing boxes to effect closure. Van Ness, however, did suspend his well mechanism from the top of the well, and *did use thrust bearings and a collar* to help close the bottom of the shaft casing.” (262 Fed. 144.)

The lowest bearing in the Getty structure was a *sleeve* bearing only, *without the weighted collar*. It was not a *thrust* bearing. In the Getty case the structure was held not to be an infringement of claims 9 and 20, *Getty v. Layne* (5th Cir. C. C. A.), 262 Fed. 141.

Figure 5 of the patent shows the thrust collar 48 is not only weighted by the weight of the lower section 39 of the shaft but also by the weight of the heavy pump runner 38 at-

tached thereto (Patent p. 2, ll. 49-51) and when the pump is running there would be the added terrific thrust of the column of water being pumped.

If Layne's shaft casing were filled with oil, such oil could not flow downward out of the shaft casing, because the sleeve bearing in the thrust bearing block 47 is completely covered over and sealed by the heavily weighted collar 48.

To get through this grinding double bearing the oil must first pass, not downward but laterally, under the contact plane of the thrust collar 48, weighted by the weight of a shaft section, pump runners, and water being pumped, all heavily thrusting it down on the bearing block 47.

Any oil which might (theoretically) pass in a thin film under the tightly contacted planes of the rapidly revolving thrust collar on the thrust block, would then pass down through the sleeve in the block 47 where it would be further used, dissipated and spent with the thousand revolutions per minutes of the actuating shaft. No oil could pass through this double bearing. All lubricant working into the bearing would be used up therein, the thrust collar 48 forms a *complete seal* over the bearing block 47 on which it thrusts, just as the thrust collar in the infringing Van Ness structure did. Resting on the long brass bushing, it formed a mechanical

closure whether the pump was operating or at rest.

And then below this thrust bearing is the stuffing box 40 with its adjustable cap 41. The patent provides special tightening means for this stuffing box to jam the packing against the shaft. This tightening means is the tubular shaft 44 to operate on screw 42 with a sprocket chain 46 to turn other screws at the same time and thus press the cap down and tighten the packing. (Patent p. 2, ll. 66-82.) Below that is the short sleeve bearing above mentioned.

With all these closure means the specifications of the patent describe the closed casing as an "air-tight chamber" with "water kept out \* \* \* kept filled with clean liquid." (Patent p. 3, ll. 79-82.)

These provisions are for a mechanical air-tight closure.

#### VIII.

### **BYRON JACKSON THE INVENTOR OF THE MODERN DEEP WELL PUMP AND ITS SHAFT CASING.**

Byron Jackson was the inventor who developed the modern small bore deep well pump and adapted the shaft casing thereto for purposes not contemplated in the Layne patent.

Byron Jackson, and not Layne, is the one who conceived and diligently reduced to practical use the type of shaft casings now used

by manufacturers of centrifugal pumps in deep water wells.

**Byron Jackson's 1890 Patent Pump With  
Shaft Casing.**

Byron Jackson had used shaft casings for many years for his pit pumps that were placed in large-sized well holes set on the bottom of the well with a side separate discharge pipe independent of the shaft casing. This is shown in his 1890 patent which had a shaft casing surrounding the shaft of a pit pump with a side or eccentric discharge casing corresponding to Layne's discharge casing No. 23. His patent is dated November 11, 1890, No. 440252.

In Byron Jackson's 1890 patent a small pipe connected the side discharge pipe with the shaft casing so as to inject therein a small stream of water for lubrication of the shaft bearings. Until the pump was well started there was an oil cup at the top, the part designated "M," to allow oil to descend into the casing by gravity and lubricate the shaft bearings below.

**Byron Jackson's 1901 Sludge Pump With  
Shaft Casing With Intermediate Bearings.**

In 1901 Byron Jackson Machine Works constructed a sludge pump, the drawing of which appears R. 1114.

This exhibit, 1-C-66, dated May 6, 1901, was a drawing for a pump on an order from a hotel located in San Francisco.

Frank Jackson testified that it was destroyed in the San Francisco fire. [R. 464-465.]

This sludge pump was a modification of the construction shown in the 1890 patent, in two small, but important respects: (1) the connecting pipe between the discharge pipe and the shaft casing was done away with, leaving the oiling system as the sole lubrication means; (2) an intermediate shaft bearing within the shaft casing appears.

On account of the discharge of the water through a side discharge pipe in the old pit pump the weight was not distributed evenly and the side thrust of the water made it necessary to rest the pump on the bottom and brace it. Byron Jackson developed a center discharge.

#### **Byron Jackson's 1900 Pump With Concentric Water Discharge Casing.**

At the time of the construction of the sludge pump of 1901, Byron Jackson was already experimenting with a pump to discharge directly into the center instead of at one side, "the shaft running through the pipe, thus to be coupled up and hung in the well by the pipe, having no other framework." (Byron Jackson's letter Feb. 17, 1902, Mead Exhibit 2, R. 54.)

The pump mentioned in this letter was one to go in a 10" well. It is shown in drawings sent to Engineer Mead dated December 27, 1900, 1-D-14, Mead Exhibit 92 and 3-B-41,

Mead Exhibit 93. [R. 227-231.] There is no shaft casing in this pump but the discharge casing is concentric with the shaft which is supported at its lower end on a thrust ball bearing.

The ball bearing, however, was found to be a failure because running in the water it wore out, and Frank Jackson testifies that, after some discussion,

"then the suggestion came to Mr. Jackson or myself, I think perhaps at the same time, that we put a tube around the shaft and put oil into that tube and protect the bearing by that." [R. 395.]

Frank Jackson also testified:

"As soon as we conceived that idea (a tube to protect the bearings) Mr. Jackson says we will make a larger one. This pump is too small to get that tube in, and he ordered the drawings made for a larger size of that same type of pump, and then in order not to have the speed excessive, we made it, as I remember, with about three stages." [R. 396.]

The drawing for the larger size of the same type of pump in three stages, referred to by Frank Jackson in the quotation immediately above, is dated March 5, 1902. (Mead Exhibit 6, R. 1063.) It shows a *shaft casing within a suspended concentric water discharge casing*. This drawing is designated on its face, 1-C-75, general drawing of a 3½" vertical series centrifugal pump with three steps to go in a 16" casing well capacity from 500 to 800 G. P. M. (gallons per minute) head 150 ft. R. P. M.

(revolutions per minute) 1500 to 1800 D. C. (direct connected) 15 H. P. W. (horse power Westinghouse) motor.

**Byron Jackson's 1902 Drawing With Concentric Water Discharge Casing and Inner Shaft Casing.**

This drawing was sent to Engineer Mead in a letter dated March 31, 1902 (Mead Exhibit 5, R. 59, 74) with another drawing showing a double discharge pipe carrying the shaft in between. This was another construction for maintaining proper balance, and thus avoiding disturbance of balance by a single side discharge pipe.

We quote a portion of the letter as follows:

"SMALL PUMP IN WELL CASINGS—We have never taken the time to work this out carefully in full detail, but have done considerable sketching, and herewith enclose 2 of them,—*one where the shaft is in the discharge pipe; the other where the discharge pipe is made in two and the shaft is run between them. This pump has to be coupled together and dropped in the well and supported from the top.* We believe it is quite possible to work out an efficiency and satisfactory pump, and the cost would not be greater than any centrifugal pump for the same purpose, as all pumps have to have vertical shafting or connecting rods and discharge pipes; but it is special work, and we have not done enough of it to make an offhand estimate. As I wrote you before, *we made a 10" pump something on these lines*, but we used propeller blades for a runner instead of centrifugal pump runners and while our test pumped a large quan-

tity of water, we did not make a thorough test of efficiency, but we did enough of it so that we decided that the efficiency is not as good as the centrifugal runner and for this reason abandoned it; but we can just as well use the centrifugal runner which makes it but a trifle larger in diameter, but it gives us a much better opportunity to *balance the weight of the shaft*, and makes a more compact plant, besides we are dealing with something that we are continually having experience with, and can design a pump with some certainty as to its efficiency, capacity and *balancing power*. As soon as we get time, we propose to enter upon a thorough experimenting with pump and test. We propose to manufacture a pump and thoroughly test it, when we will be able to give you definite information.

\* \* \* \* \*

Yours truly

BYRON JACKSON MACHINE WORKS,

Per

Byron Jackson."

[R. 62, 63, 64.]

All this is two months prior to Layne's earliest orally claimed conception date, May, 1902, and more than a year previous to his patent application filing date, April 28, 1903. His patent application is his earliest drawing proven, dated April 3, 1903. [R. 962.]

Layne devised a system of wedges to enable him to support the pump above the bottom of the well and balance or brace it against the side and down thrust of the side discharge of water.

Byron Jackson, however, designed his pump to discharge directly into the center, instead of



at one side, the shaft to run through the pipe, "thus to be coupled up and hung in the well by the pipe, having no other frame-work." (Jackson's Feb. 17, 1902 letter, Mead Ex. 2, R. 54.)

Using the concentric discharge casing brought the water up around the shaft to the detriment of the bearings and prevented oil lubrication unless protected in some manner. To furnish this protection and give a channel for the flow of the oil to the bearings Byron Jackson conceived the idea of putting an inner tube or shaft casing around the shaft and feeding his oil in at the top. This would protect the bearings and enable their lubrication by oil fed in and flowing down by gravity.

To hold the inner tube against whipping he first devised a crude form of spider which served a double purpose, constituting a bearing for the shaft and a coupling for the inner tube. A short time later this spider was developed so as to serve at its outer circumference as a coupling for the sections of the concentric discharge pipe and to hold the inner tube and shaft in alignment.

The shaft's weight was carried on a thrust bearing at the top of the well.

This was a total re-organization and produced a new entity not contemplated or suggested by the Layne patent but universally adopted in the art.

Jackson taught the practical art; Layne did not.

**Byron Jackson's 1903 Installed Pabst Pump  
With Concentric Discharge Casing and  
Inner Closed Shaft Casing With Inter-  
mediate Bearings.**

The installation of the first pump embodying the concentric discharge casing with the inner shaft casing was in 1903.

On March 18, 1903, Mead wrote to Byron Jackson asking the price on a pump to be furnished to the Pabst Brewing Company of Milwaukee. [Mead ex. 8, R. 86, 87.] Byron Jackson wrote him in reply April 8, 1903, quoting a price of \$1500. [Mead ex. 12, R. 91-93.]

April 15, 1903, Engineer Mead wired Byron Jackson, offering \$2500 for the pump complete. [Mead ex., 15 R. 97.]

April 20, 1903, a contract was made up in triplicate specifying "The pump shaft to be enclosed in a pipe within a discharge pipe." [Mead, ex. 22, R. 111.]

April 29, 1903, Byron Jackson writes Engineer Mead, describing the Pabst pump and stating, "You will note that shafting is enclosed in 4" pipe and intended to be water and oil tight, oil fed in at the top letting it find its way through each bearing," etc. [Mead, ex. 44, R. 166.]

After some further negotiations on September 5, 1903, a new form of contract was executed between Byron Jackson and the Pabst Brewing Company for the installation of the pump. [Mead, ex. 37, R. 145.] In October,

1903, Mr. Robb, an employee of Byron Jackson, went to Milwaukee to install the pump [R. 406, 471, 158], and on January 12, 1904, the same was installed and working. [Mead, ex. 43, R. 159.] It successfully operated for months. [Mead, ex. 53, R. 180.]

Subsequent to the date of completion of the Pabst pump Layne's claim 20 was proposed to the patent office on January 30, 1904 [R. 980.]

Regarding this first pump Engineer Mead says:

"\* \* \* But I have a very distinct recollection concerning the general features of this pump, because the pump was built at my request and in accordance with my suggestion, and *was the first pump of the kind that I ever know of being installed*, and I was very much impressed with the value of that kind of pump, and it left a very clear impression on me of the general outline of that pump. Now, as far as dimensions and all these things that constitute details are concerned, I confess that they are hazy. As I have said, I don't remember all these dimensions, *but as to the arrangement of discharge pipes, and of enclosed shafts, and the arrangement in general for separating the shaft from the discharged water, and to permit of the oiling of the interior bearings and keeping the water away from them*—those matters were impressed on me very, very distinctly by my study of the situation and my conversations and correspondence with Mr. Jackson. I believe I could swear to those as long as I live, because *it was the first pump of the kind* and I was very much interested in it, not only as an engineer, but as a development in the line of pumping machinery in which I was greatly interested." [R. 253-254.]

IX.

**CONTRAST OF BYRON JACKSON'S INVENTION, THE MODERN PRACTICE, WITH THE LAYNE PATENT.**

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**1. Center Discharge of the Water in Jackson's Mechanism and Side Discharge in Layne's Patent Disclosure.**

When Byron Jackson began working on the problem of a "small pump in well casing" he first conceived of discharging his water in a column concentric with the shaft, discharging his pump "directly into the center" [R. 54], that is through a discharge pipe which likewise surrounded the pump shaft. This shaft thus was surrounded with water. When he tried his model for a 10" well he found it unsuccessful as to lubrication. There was what he describes later as difficulty in "oiling the shafting and friction of couplings in water." [R. 54.]

The suggestion then came to him to surround the shaft with a casing cutting off the discharging water from the shaft and when this was tried it was found successful and was used in the first pump of this type installed, the 1903 Pabst pump.

The old style pump discharged at one side and not into the center. The side discharge is the form illustrated in Layne's patent, figures 1 and 5 and 10 to 13 as well. Even where the

patent's suggestion for the modified form that the discharge pipe 23 may be omitted and the well casing itself act as a conveying channel the opening in the top of the pump casing is for discharging the water at one side. The concentric wedges used for that form would center and hold against the side thrust.

**2. Support of Mechanism on the Concentric Discharge Casing by Byron Jackson, Mounted on Wedges by Layne.**

Byron Jackson in adopting the idea of discharging directly into the center, "the shaft running through the pipe" perceived that his mechanism could "thus be coupled up and hung in the well by the pipe, having no other framework." [Letter, Feb. 17, 1902, Mead ex. 2, R. 54.]

In his letter of March 31, 1902 [Mead's ex. 5, R. 63] he also writes:

"This pump has to be coupled together and dropped in the well and supported from the top."

In the proposed Pabst contract of April 20, 1903 [Mead ex. 22, R. 111] it is provided:

"The pump to be suspended in the well by the discharge pipe."

In the executed Pabst contract, Sept. 5, 1903 [Mead ex. 37, R. 147] he provided:

"The pump to be suspended in the well by the discharge pipe attached to the cast iron pulley frame and discharge elbow."

Layne, however, using a side discharge casing must balance his mechanism either by resting on the bottom of the well or by means of bracing devices. His conception was his wedge system, of which were two forms, one in series, the other annular to make the platform 61 water-tight.

**3. Shaft Weight Support on Ball Bearings in Pump Head by Jackson, Sectionally by the Shaft Casing, in Layne's Patent.**

Byron Jackson with his concentric discharge casing needed, as he says in his letter of Feb. 17, 1902 [Mead ex. 2, R. 54] "no other frame work."

So also Layne in his preferred form of structure with his wedges needed no other frame work. The modified form has a frame work.

The specification reads:

"In the case illustrated, the top of the shaft may be provided with a pulley 25 as before, and a bearing fixed on some part of the frame work, on the cross beam 57. Extending downward from the beam 57 may be provided a timber 56, and part way down a bearing and support provided for the casing of the pump shaft 60, by means of the block 67, which is carried on a cross frame 68"; (Patent, p. 3, ll. 15-23).

Where the old frame work with its bearings and support for the shaft is eliminated some other means must be devised to carry the long heavy shaft.

Byron Jackson supported his shaft as a unit on a single thrust ball bearing at the top of the well.

In his letter of Mar. 31, 1902 [Mead ex. 5 R. 60] he says:

"The balance device can be arranged to carry almost any load except this one item, that a *thrust bearing or ball bearing* must be provided to carry the *total weight of shaft* and fittings while the pump is running empty."

In his letter of April 15, 1903, Mead ex. 21 [R. 107] he stated:

"I do not think, however, that it would be possible to make a complete balance of the shafting, but it would be approximate enough so that good ball bearing thrust collars will carry the end thrust of shaft either up or down."

In his letter of April 29, 1903 [Mead ex. 48, R. 167] he stated:

"The top bearing is provided with ball thrust bearings to carry the weight of the shaft when commencing to pump, and the shaft is intended to be automatically balanced.

"I specified in the specifications that it would be approximately balanced, but after making the drawing I believe it will float by the pressure of the discharge water and have no end thrust at all."

In his contract of Sept. 5, 1903 with Pabst [Mead ex. 37, R. 148-9] he provided:

"\* \* \* the shaft will be partially and approximately balanced by the discharge pressure of water acting on the pump runners, and the unbalanced end thrust of shafting either up or down will be held in place by a suitable end thrust shaft bearing."

Layne's object, however, was, as expressed in his statement of objects, "to provide an extensible pump shaft *separately supported at intervals* along its length." (Patent, p. 1, ll. 35-37.) This he did by bearing blocks 47, 47', etc., at the end of each section of shaft supporting a section of shaft on the thrust collars 48, 48', etc. (Patent, p. 2, ll. 38-57, 97-100.)

The bearing blocks of the Layne patent are supported by the shaft casing. Thus the weight of the pump and shaft and the thrust of the pumped water is borne by the shaft casing mounted on the wedges.

This making of the shaft in sections "which are attached together by means of sliding keys so as to allow them some vertical play with relation to each other" (patent, p. 2, ll. 40-42), resembles the 1899 Northam patent which is described as coupled by universal joints consisting of knuckles secured by pins.

The Northam patent states:

"\* \* \* the jointed pump-shaft being adapted for well casings that have become bent in driving \* \* \*." [R. 1033, ll. 38-40.]

It may be that the construction of the shaft in sections "so as to allow some vertical play with relation to each other" should be considered as intended to correct errors in alignment in view of the Northam patent's disclosure. With this extensible pump shaft separately supported in sections the shaft casing might possibly not be absolutely in true alignment and yet



the wedges would center the pump casing and thus the bearing and stuffing box at the top thereof would put the shaft in proper vertical position and the play in the joints allow for irregularities in the line of the shaft casing.

Layne's shaft casing was not intended to prevent lateral movement or whipping of a shaft operating as a unit through the bearing because each section of his shaft was separately supported,—was an independent shaft between the bearings.

#### **4. Protection of the Shaft and Bearings Without Bottom Thrust Bearing by Byron Jackson, With It by Layne.**

Byron Jackson used stuffing boxes at the top and bottom of his shaft casing to close it against the entrance of water and thus protect his shaft and bearings. But he did not use a thrust collar to seal his lowest sleeve bearing for the shaft.

"Layne, according to the specifications of his patent, effected his closure at the top and bottom of his shaft by the presence of stuffing boxes, assisted by the effect of a downward thrust bearing and coliar. In practice, Layne soon abandoned the use of packing baxes, substituting therefor a long sleeve bearing and retaining the coliar. The downward thrust of the weight of the shaft and pump, together with the downward pressure of the column of oil in the shaft casing, accomplished his closure." *Getty v. Layne* (C. C. A., 5th Cir.) 262 Fed. 143.

The above quotation states that the closure is "assisted by the effect of a downward thrust bearing and collar." That refers to the thrust bearing shown in Fig. 5 where the collar seals the sleeve bearing and thrusts down and thus assists in excluding water from the chamber above.

**5. Lubrication of Shaft and Bearings, Circulation of Oil by Byron Jackson, Stagnant by Layne.**

Byron Jackson provided a circulatory lubricating passage through his shaft casing from top to the bottom where the unused oil passed into the well.

In his letter of April 29, 1903 [Mead ex. 44, R. 166] he stated:

"You will note that the shafting is inclosed in a 4" pipe and intended to be *water and oil tight*, and the oil fed in at the top, letting it find its way through each bearing and down the pipe to the pump, where there is arranged suitable drain pipes to permit the water to drain out of the pipe what leaks through the last bearing of the pump where the waste oil will also get out and be pumped through the water, which I presume some people will object to, but, as you know, it is a very homeopathic quantity and does no harm."

In a letter regarding the Geneva pump of the same type [Mead ex. 46, R. 169-170], dated July 7, 1903, he stated:

"\* \* \* the oil in the pump bearings being led to them from the top by a pipe while the shaft bearings are oiled simply by the waste

oil dropping from one bearing to another inside of the 4" pipe."

In the contract of September 5, 1903, with Pabst [Mead ex. 37, R. 146-147] Byron Jackson provided:

"The vertical shaft bearings to be oiled by means of a sight feed into the top of the four (4") inch pipe that supports the shaft bearings, the oil passing through each bearing to the one below it, and may finally pass into the well at the half-inch drain-pipe when the water in the well is pumped below it; all as shown in drawings herewith submitted and marked 1. E. 72, and 3. E. 22, and are made part of these specifications. The total length from bottom of suction to discharge will be (at top of well) two hundred (200) feet."

Layne, however, had a stagnant system, so designated by both the Fifth and Ninth Circuits, his shaft casing being provided with means to maintain an "*air-tight chamber*" to be "kept filled with clean liquid."

(P. 471) "In *Getty v. Layne* (C. C. A.) 262 Fed. 141, the court, on page 143, in discussing lubrication, referred to the closed casing as causing a *stagnation of oil in the bearings.*"

\* \* \* \* \*

(P. 472.) "\* \* \* by this device the oil becomes stagnant in the bearings, and is blown out when sufficiently used or spent, \* \* \*"

*Western Well Works v. Layne & Bowler Co.*, 276 Fed. 471-472.

6. Alignment of Shaft and Bearings, Spiders and Bearings by Byron Jackson, Wedges and Bearings by Layne.

Byron Jackson used a crude form of spider, with 3 set screws or bolts backed against his discharge casing, as bearings for the shaft [R. 448]. On to these spiders he screwed his sections of shaft casing. Alternate bearings were used without set screws.

Layne kept his shaft casing in alignment by means of his wedges.

"I provide a system of wedges 33 which serve to keep the pump in place and hold it in proper vertical position." (Patent p. 2, ll. 4-7.)

"\* \* \* The wedge system illustrated for tightening the pump casing in place may also, if desired, be used to center it with respect to the casing." (Patent p. 2, ll. 105-108.)

This is the only discussion in the patent of anything like alignment. The word itself is not used nor any equivalent. None of the claims, except possibly those mentioning bearings for the shaft, contain any suggestion of alignment. Bearings are not an element of either claims 9 or 20.

**Summary.**

It appears from this analysis that Byron Jackson's fundamental element is a *concentric discharge casing*. This has an inner shaft casing enclosing the shaft within. At first the shaft and shaft casing were held in alignment

by spiders braced against the inner walls of the discharge casing. The spiders were later changed in form to become sleeve couplings for the discharge pipe with spiders cast integral.

Layne, on the contrary, bases his structure on a *wedge system* designed to hold in proper vertical position and center with respect to the well casing, a shaft casing extending to the top of the well with a *side discharge pipe*.

Both mechanisms were designed to do away with the old framework on which were the bearings for the shaft. To support these bearings Layne devised a shaft casing extending to the top of the well, which carried the weight of his shaft in sections, the shaft itself being extensible at its joints to accommodate any irregularities in the alignment of the well bore.

Byron Jackson suspended his shaft from the top on a single thrust ball bearing and aligned it within his concentric discharge casing by means of the spiders braced against it. So also the inner shaft casing was held in proper vertical position and centered by the spiders.

The main features of the Byron Jackson construction are those used today in modern deep well construction, to-wit: the concentric discharge casing with the inner shaft casing, the shaft suspended as a unit from the top of the well on a single thrust bearing, the shaft and shaft casing aligned by spiders supported by the discharge casing.

Layne's main features have not been adopted, to-wit: the wedges for mounting the pump, fixing it in place, centering and holding it in proper vertical position; the extensible jointed pump shaft supported at intervals along its length, the side discharge pipe and the "air-tight chamber" shaft casing supporting the shaft's weight in sections.

Byron Jackson's mechanism is that which has revolutionized the art. The Fifth Circuit's finding that Layne did so, was made without knowledge of Byron Jackson's invention and on the basis of Layne's commercial success, *which was due to his adoption of Byron Jackson's teachings.*

## X.

### BYRON JACKSON'S ANTICIPATION OF LAYNE'S SHAFT CASING.

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#### 1. The 1901 Sludge Pump a Complete Anticipation.

We have already pointed out how Byron Jackson Machine Works sludge pump of 1901 shown in the drawing 1-C-66 [R. 1114] is a complete anticipation of Layne's shaft casing with its three alleged functions.

This 1901 sludge pump had a shaft casing with three functions:

(a) Protection by means of stuffing boxes at top and bottom.

(b) Lubrication by oil in a chamber closed by top and bottom stuffing boxes.

(c) Alignment with the aid of an intermediate bearing.

The features outlined in the sludge pump are equivalent to the corresponding features shown in the Layne patent.

The 5-inch tube in the drawing 1-C-66 corresponds to Layne's tube, his shaft casing 20, shown in Fig. 8; the shaft  $1\frac{7}{16}$  of an inch in diameter corresponds to his shaft 39, 39' and so forth; the intermediate guide and thrust bearing marked 3 inches outside diameter corresponds to his guide and thrust bearing 47, and the thrust block immediately above this bearing corresponds to Layne's figure 48. The pump shaft and gland or stuffing box on the shaft marked  $2\frac{1}{4}$  inches in diameter, corresponds to the stuffing box shown in Layne's figure 5 as No. 41. The construction of the two devices parallel each other very closely.

In the Layne patent there is a stuffing box consisting of a stuffing box cover or gland 41, and a packing space 40.

In Layne's figure 5, the stuffing box studs are shown as being operated by a rod from the surface, No. 44. In Byron Jackson's drawing the stuffing box bolts shown in the cross-section to the right are arranged to extend outside of the protecting tubes and to be operated from above.

The sludge pump had a shaft casing which protected, as Layne's did, with top and bottom stuffing box and with means for tightening the lower stuffing box, though no thrust collar sealed the lowest sleeve bearing.

The sludge pump's shaft casing lubricated, as Layne's did, the shaft and bearings by means of a "chamber" "kept filled" with clean liquid.

The shaft casing also aligned, as Layne's is alleged to do, by means of an intermediate bearing, the lack of which in Crannell prevented the Fifth Circuit in the Getty case from finding Crannell an anticipation.

"\* \* \* \* The limited depth of the pit, in which the Crannell patent was to be used, made it also unnecessary to use a jointed shaft and *intermediate bearings*. Layne solved his problem by the use of a jointed shaft with *intermediate bearings*, \* \* \*"

*Getty v. Layne*, 262 Fed. 142.

The shaft casing of the sludge pump could have been adapted to a small bore well by Layne's wedges, if same were effective. It was adapted to a small bore well by Byron Jackson in his 1902 drawing and disclosure and his 1903 Pabst pump reduction to practice. In these later forms Byron Jackson put the shaft casing inside the discharge casing, took off the thrust collars from this shaft, using sleeve bearings from the top to the bottom, and put in a drain pipe [R. 452] at the bottom. The



sleeve bearings and drain pipe destroyed the chamber feature and made the lubrication system circulatory.

**2. Byron Jackson's 1902 Invention as Reduced to Practice in 1903 Pabst Installation; a Complete Anticipation of All Possible Useful Features of Layne.**

Byron Jackson's 1902 invention as disclosed in the drawing 1-C-75 [R. 1063] and the 1903 installed Pabst pump also *anticipates all the useful features* of Layne's shaft casing. It protects the shaft and bearings by stuffing boxes top and bottom. It provides for lubrication. It has intermediate bearings. It aids in alignment.

The only difference is that pointed out in the ninth circuit. It provides for oil draining out at the bottom through the sleeve bearings and drain pipe in order to cause a circulation of oil through the bearings.

Getty had no drain pipe but the sleeve bearing was sufficient opening to avoid infringement.

**XI.**

**DECISIONS OF FIFTH AND NINTH CIRCUITS—POINTS IN HARMONY.**

The Fifth and Ninth Circuits are in entire accord on the following points:

1. That the "Novelty and Patentability" of the Layne Patent "Admit of Doubt" and Can Only Be Sustained by a Restrictive Interpretation.

The case of *Van Ness vs. Layne* (5th Cir. C. C. A. 1894) 213 Fed. 804 found claim 13 not infringed, refused to sustain claim 9 in addition to claim 20, and doubtfully found claim 20 valid and infringed. The court said:

"though theoretically its novelty and patentability may admit of doubt." (213 Fed. 808.)

"and it seems that the question of infringement, like that of patentability, is a close one." (213 Fed. 809.)

The Van Ness decision only sustained claim 20 by reading into it limitations not expressed and finding that it covered a shaft casing with a triple function, attributing to the "protective casing" the additional functions of lubrication and alignment.

The court said:

"It seems quite clear that the idea of a protected casing without *restrictive* interpretation would contain no novelty and would not be patentable, and, if this element in the patent is given the unrestricted meaning that its language admits of, it would destroy the claim." (213 Fed. 807.)

The language referred to reads:

"\* \* \* a line shaft for the pump entirely closed off from the water in the well."

It will be noted that the "protective casing" is not stated as an element.

The later Getty case also sustained Claim 20 as thus restricted, though in the Getty case the court, realizing that the claim did not use the terms "closed casing" or "protective casing" or their equivalent, ceases to use this form of expression, but expresses it as a "closed shaft."

The court said in the Getty case:

"It was only by giving the claim this *restricted* meaning, and *limiting* it to the description in the specifications, that the claim could be sustained." (262 Fed. 142.)

In the earlier Van Ness decision the court evaded to a large degree the mechanics of the patent. The court said:

"We must confess that we are not mechanics enough to determine with any assurance from the record the merits of these respective contentions, and it seems that the question of infringement, like that of patentability, is a close one." (213 Fed. 809.)

Judge Jack, district judge, Western District of Louisiana, in the later case (*Layne v. Getty*), involving the same patent, being embarrassed by the Van Ness decision, said:

"Were the question a new one, I should be inclined to hold the *patent invalid*.  
\* \* \*." [R. 1011.]

"As stated by the court in the Van Ness case, the question both as to patentability and infringement are close ones."

"Following the ruling in the Van Ness case, specifications numbers 9 and 20 must

be held invalid and infringed by defendant's pump." [R. 1016.]

Six years after the Van Ness appeal decision, the same judge wrote the Getty appeal opinion. He was then undoubtedly more learned in patent law, and he had the light of greater exposition before him with respect to the patent in suit and Layne's lubrication system.

With this clearer comprehension of the mechanics and law involved Judge Grubb in his later decision narrowed the patent to the specific mechanical means set out in the specifications of the patent, and greatly qualified and limited his former opinion, in effect overruling that portion of it dealing with lubrication.

In *Layne vs. Getty* (5th Cir. C. C. A.) 222 Fed. 917, on appeal from an order refusing a preliminary injunction, the court sustained Judge Jack's order because infringement was in doubt, though the patent had been adjudged valid, and on the second appeal case found non-infringement.

The Circuit Court of Appeals in the Ninth Circuit said:

" \* \* \* In *Van Ness v. Layne*, 213 Fed. 804, 130 C. C. A. 462, the patent was held valid and claim 20 infringed. \* \* \* But *the court was not very confident* that the protective casing as set out in the specification contained novelty enough to constitute invention. The fact, however, that there was for some time an unfilled want for some such apparatus as that disclosed by the patent, in the deep well irrigating

industry, persuaded the court that the idea involved invention, though theoretically its novelty and patentability *might admit of doubt.* \* \* \*

*Western Well Works v. Layne & Bowler Corporation*, 276 Fed. 470.

Where the novelty of the invention is open to doubt, the patentee should be held to a rigid construction of his claims.

*Wright v. Yuengling*, 155 U. S. 47, 15 Sup. Ct., Rep. 1, 39 L. Ed. 64.

**2. The Layne Patent Is "Limited and Narrow" With a Corresponding Narrow Range of Equivalents.**

In *Getty vs. Layne* (5th Cir. C. C. A. 1920), 262 Fed. 143, the court said:

"Its advance over Crannell (1890 patent 13 years prior to Layne's filing date) prevented Crannell being considered by us an anticipation, and was enough to show novelty, *but it stops there.*"

The Ninth Circuit Court of Appeals said:

(P. 471) "In *Getty v. Layne* (C. C. A.), 262 Fed. 141, \* \* \* the court held that the patent was not entitled to the wide range of equivalents of a pioneer patent."  
\* \* \*

(P. 470) "\* \* \* when we turn to the analysis of the claims in suit, we find that the essential elements claimed to have been infringed are *limited and narrow*  
\* \* \*"

*Western Well Works v. Layne & Bowler Co.*, 276 Fed. 470-471.

### 3. The Layne Patent Calls For An Entire Closure,

claim 20 reading, "a line shaft for the pump entirely closed off from the water in the well" and the specification describing the shaft casing as "an air-tight chamber."

In the Getty case the court said:

(P. 143) "Layne, according to the specifications of his patent, effected his closure at the top and bottom of his shaft by the presence of stuffing boxes, assisted by the effect of a downward thrust bearing and collar. In practice, Layne soon abandoned the use of packing boxes, substituting therefor a long sleeve bearing and retaining the collar. The downward thrust of the weight of the shaft and pump, together with the downward pressure of the column of oil in the shaft casing, accomplished his closure."

\* \* \* \* \*

(P. 144) "The mere fact that Getty's closure is not complete, or not as *complete and effective* as that of Layne, is an unimportant fact. The material difference lies in the fact that Layne's patent effects the closure by *physical obstructions*, such as *packing boxes* and *thrust bearings*, aided incidentally only by the presence of the oil column, while Getty's *partial closure* is effected by balancing the pressure of the column of water outside the shaft casing against the pressure of the oil inside the casing, without the use of *physical obstruction*."

*Getty v. Layne*, 262 Fed. 143-144.

In the Ninth Circuit Court of Appeals the court said:

(P. 471) "With respect to the shaft casing protecting the shaft from the ingress of water, claim 20 provides that the line shaft shall be *entirely* closed off from the water.

\* \* \* \* \*

This specification (referring to the ejecting of spent liquid and refilling) clearly calls for an *air-tight casing* as provided in the other specification previously referred to.

(P. 472) "In the Layne patent the shaft casing is *entirely closed*, or that is the invention claimed in claim 20 and is necessarily the operative device of that claim and of claims 9 and 13, \* \* \*

We are of the opinion that there is invention in the *entirely closed* casing of the Layne patent as claimed in claims 9, 13 and 20, particularly claim 20, functioning as it does in *complete* protection to the line shaft from the ingress of water and sand and in protecting the means for lubrication."

(P. 476) "The Layne application for a patent was filed in the Patent Office, April 28, 1903. The dominant element in that invention was the claim for a line shaft for the pump *entirely closed off* from the water in the well."

*Western Well Works v. Layne & Bowler Co.*, 276 Fed. 471, 472, 476.

#### 4. The Layne System of Lubrication Is "Stagnant"

providing for forcing out spent liquid at the top, and is not infringed by "a circulatory system" such as Getty, Byron Jackson and the Western Well Works structures have providing for passage out of oil at the bottom.

"In *Getty v. Layne* (C. C. A.), 262 Fed. 141, the court, on page 143, in discussing lubrication, referred to the closed casing as causing a *stagnation of oil* in the bearings. The court said:

"Layne's method of lubrication was to put the oil in at the top and to permit it to descend to each of the bearings, and *remain stagnant* within the shaft casing until ejected from the top after it had become spent by air pressure through an air vent. When it was ejected, it was replaced by clean oil from the top again. On the other hand, *the oil was confined* at the bottom of the well by use of a packing or stuffing box. *Getty adopted a circulatory system* of lubrication. By it the oil was also introduced from the top, and descended to the lower bearings by gravity. However, at the bottom there was *only a partial obstruction* to its exit, presented by a long sleeve bearing. Its passage out from the shaft casing was automatic and continuous, so that there was a constant and free flow of lubricant from the top of the line shaft, throughout its length, and out through its bottom. This method was claimed to be necessary to Getty's device, because wear on the upper bearing required a continuous supply of fresh oil for its proper lubrication. These functional differences between the *stagnant* and *circulatory* system of lubrication prevent their being considered as merely mechanical equivalents."

"\* \* \* by this device the oil becomes *stagnant* in the bearings, and is blown out when sufficiently used or spent, \* \* \*"

*Western Well Works v. Layne & Bowler Co.*, 276 Fed. 471, 472.



5. That Specific Means for the Escape of Oil at the Bottom of the Shaft Casing Avoids Infringement.

The Getty appeal decision reads (p. 143):

"\* \* \* However at the bottom there was only a partial obstruction to its exit, presented by a long sleeve bearing. Its passage out from the shaft casing was automatic and continuous, so that there was a constant and free flow of lubricant from the top of the line shaft, throughout its length, *and out through its bottom*. This method was claimed to be necessary to Getty's device, because wear on the upper bearing required a continuous supply of fresh oil for its proper lubrication. \* \* \*

(P. 144):

\* \* \* \* \*

We think Getty has accomplished closure and lubrication by means so functionally different from Layne's disclosure in his patent, that they cannot be said to be mere mechanical equivalents, but rather distinct methods of attaining the same object; the object itself not being patentable. \* \* \*

*Getty v. Layne*, 262 Fed. 143, 144.

The Western Well Works appeal decision reads (p. 472):

"\* \* \* the defendants' shaft is not entirely closed but permits the oil to circulate down through the bearings and *out at the bottom* while the pump is in operation."

(P. 474):

"\* \* \* but the controlling question still remains to be determined. Does the lubricating oil introduced into the defend-

ants' shaft casing pass down through the bearings, and after being used and spent, finally *pass out at the bottom* of the shaft into the well proper through a channel or auxiliary conduit constructed for that purpose? If it does, then it is not the same mechanical device for lubrication claimed and specified in the plaintiff's patent. The *plaintiff's device does not have any outlet for the used and spent oil to pass out* into the well, and as we understand the mechanical construction of plaintiff's pump, it was devised, in part at least, for the specific purpose of avoiding that objection."

(P. 477):

"\* \* \* The defendants' pump is substantially the Jackson mechanism with respect to the *discharge* of used or spent oil *from the bottom shaft* into the water of the well, and is therefore not an infringement of plaintiff's patent for an entirely closed casing for the line shaft."

*Western Well Works v. Layne & Bowler Co.*, 276 Fed. 472, 474, 477.

## XII.

### DIFFERENCES BETWEEN FIFTH AND NINTH CIRCUITS.

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#### 1. Novelty in Shaft Casing With Three Functions Including Alignment — Fifth Circuit.

In *Van Ness v. Layne* (C. C. A. 5th Cir.), 213 Fed. 804, the court said (p. 807):

"It seems quite clear that the idea of a protected casing for a pump shaft without

restrictive interpretation would contain *no novelty* and would not be patentable, and, if this element in the patent is given the unrestricted meaning that its language admits of, it would destroy the claim."

(P. 808):

"If so limited, it would seem that the protective casing intended to be covered by the claim was one of the kind described in the specifications and *having the three functions* attributed to it by the specifications, namely: (1) To exclude water and detritus from the shaft and its bearings; (2) to provide a means of lubricating the bearings of each section of the shaft from the top of the well without removing the apparatus from it; and (3) *to align* the bearings and the shaft so as to prevent lateral displacement in the well and keep the shaft in a vertical position."

(P. 809):

"The third function performed by the shaft casing of the patent in suit is that of *aligning* the bearings of the pump shaft so as to keep the latter in vertical position in the well."

(P. 810):

"\* \* \* we have come to the conclusion \* \* \* that claim 20 of the complainant's patent should be sustained, and that the defendant's apparatus should be held to infringe it in the one respect of a closed casing for the pump shaft *of the design and with the triple function* attributed to it in the specifications of Layne's patent."

In *Getty v. Layne* (C. C. A. 5th Cir.), 262 Fed. 141, the court said (p. 142):

"The twentieth claim of the patent—that sustained in the case of *Van Ness v. Layne*, *supra*—covered 'the combination of a well casing, a rotary pump therein, and a line shaft for the pump *entirely closed off from the water in the well*.' Validity was given this claim by defining a closed shaft to be *one having the three functions of* (1) *aiding the alignment of the shaft in the well casing*; (2) *providing for lubrication of the shaft and bearings*; and (3) *protecting the shaft and bearings from water and sand*."

\* \* \* \* \*

"It was only by giving the claim this restricted meaning, and limiting it to the description in the specifications, that the claim could be sustained."

(P. 144):

"Referring the closed shaft of *Layne* to the description in the specifications of his patent, as we must do, we think the differences from *Getty's* mechanism with respect to means of *alignment*, lubrication, and closure are so important that *Getty's* differing means should not be held to be mechanical equivalents, and should not be held to infringe the closed shaft of *Layne's* patent."

To find novelty the court was compelled to restrict the claim to a shaft casing with *three* functions because the prior art introduced in those cases showed *Crannell* 1890 patent [R. 1022], *Byron Jackson* 1890 patent (*Getty Record*), the 1894 *Eisler* patent [R. 1018], the 1900 *Prindle Orpheum Theatre pump* (*Getty Record*); and others which had two functions (1) lubrication and (2) protection but without

intermediate bearings hence without alignment. Without alignment the casing lacks novelty, in view of the prior art shown in the Fifth Circuit cases. The new Byron Jackson defenses in the Ninth Circuit destroy the alleged novelty.

**2. Novelty of "Entirely Closed Casing" Without Alignment Which Is Not a Function of Shaft Casing—Ninth Circuit.**

In *Western Well Works v. Layne & Bowler Co.*, 276 Fed. 465, the court said (p. 471):

"Our conclusion is that the shaft casing has only two functions: (1) To protect the shaft and its bearings from the water and sand pumped to the surface, and (2), to inclose the means provided for lubrication of the shaft bearings. The function of alignment is therefore dismissed from further consideration."

(P. 472):

"We are of the opinion that there is invention in the *entirely* closed casing of the Layne patent as claimed in claims 9, 13 and 20, particularly claim 20, functioning as it does in *complete* protection to the line shaft from the ingress of water and sand and in protecting the means for lubrication."

This decision overlooks the Crannell 1890 patent [R. 1022] with its casing closed by stuffing boxes, the Byron Jackson 1890 patent, the 1894 Eisler patent [R. 1018] with its closure means and other tightly closed casings shown in evidence in this and the prior cases.

XIII.

CONCLUSION.

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1. The Novelty Adjudged Layne by the Fifth Circuit Destroyed in Substance by the New Byron Jackson Defenses in the Ninth Circuit.

The novelty of the Layne shaft casing according to the Fifth Circuit is in the adaptation of the shaft casing to a deep well pump by the insertion of intermediate bearings creating the function of alignment.

Judge Jack, who decided the Getty case in the lower court trial, in his opinion said:

"The CRANNELL apparatus, which was not a commercial success, provided for a closed casing around the shaft transmitting power to a rotary pump, *but did not provide intermediate bearings* along the line of the shaft. This absence of *intermediate bearings* is practically the only difference in principle between the two mechanisms insofar as claims 9 and 20 are concerned." [R. 1010.]

On appeal the Circuit Court of Appeals said:

"\* \* \* The limited depth of the pit, in which the Crannell patent was to be used, made it also unnecessary to use a jointed shaft and *intermediate bearings*. Layne solved his problem by the use of a jointed shaft with *intermediate bearings*. \* \* \*"

*Getty v. Layne*, 262 Fed. 142.

The Byron Jackson 1901 sludge pump [R. 1114] and the 1902 drawing 1-C-75 [R. 1063]

and the 1903 pump were not in the Getty case. These all provide for intermediate bearings, though not shown in 1902 drawing. (See drawing, Mead ex. 74, R. 1065, small figure for spider bearing. If the Byron Jackson defenses had been in the Getty case the Layne patent would have been found invalid, because the alleged alignment function of the shaft casing was anticipated by Byron Jackson.

We pointed out to the Circuit Court of Appeals in the Ninth Circuit that the function of alignment was not mentioned in the patent nor claimed in the claims and particularly that neither claims 9 nor 20 contained the element "intermediate bearings" necessary for alignment.

That court sustained our contentions and eliminated alignment from consideration.

## **2. The Novelty Found by the Ninth Circuit in Layne's "Entirely Closed Casing" Is Without Utility.**

The Circuit Court of Appeals in the Ninth Circuit, however, still found novelty in the shaft casing of claims 9, 13 and 20 in providing for an "*entirely closed*" casing, the "*air-tight chamber*" of the specifications.

We concede novelty in the contrivance for making an air-tight chamber with the special tightening means for the lower stuffing box and the mechanism for forcing out spent oil at the top. They are and were unique but *lack utility*.

Such a structure was never built; it has never been used.

Mr. Layne himself admitted [R. 595] that he never used the stuffing box 41, Figure 5 of the Patent, and that he had never used the adjusting mechanism shown by the sprocket chain 46, and the sprocket 42, 42', 42'' shown in Figure 6 of the Patent, nor the pipe 44 shown in Figure 5 down to the bottom of the shaft tubing. He further admitted [R. 598] that he had never used the thrust collars 48 and 48' for thrust purposes. [R. 599.] "So far as contacting the bearings, we have never used that (thrust collar 48) as a commercial product, containing the bearings for thrust purposes."

Where a device has never gone into actual use much caution is exercised by the courts in attributing to the patent anything more than is plainly shown and distinctly claimed.

Non-use raises an inference against utility.

*Henry v. City of Los Angeles* (9th Cir.),  
255 Fed. 769, 780, quoting:

*National Malleable Castings Co. v. Buck-  
eye M. I. & C. Co.* (6th Cir.), 171  
Fed. 847.



Layne's air-tight chamber shaft casing not only never has been used, but could not be used.

No lubricant could work through the thrust bearings shown in Layne's patent. They are each too heavily weighted with the section of shaft below. In Byron Jackson's sludge pump his intermediate thrust bearing collar was attached to a shaft passing as a unit through the bearings. Oil would work through on account of the irregularities in the motion of the shaft. It differed from Layne's jointed shaft and bearings in this respect. Moreover in the sludge pump there was only the one of such bearings to work through. For a long shaft such bearings would be impracticable.

Byron Jackson was afraid that the oil would not get through his intermediate bearings in the Pabst pump, though they were only sleeve bearings without the shaft thrust-collar seal.

So, to be sure that the oil would get through the intermediate bearings, he bored an oil hole [R. 473] and put in a little  $\frac{1}{4}$ " pipe extending up above the bearing about  $\frac{3}{8}$  or  $\frac{1}{2}$  of an inch so as to flood the bearings and allow the excess to pass down through. [R. 399.]

Byron Jackson's fear, as to oil failing to pass through his sleeve bearings, is a certainty as to Layne's thrust bearings.

Layne's air tight chamber closed with stuffing boxes top and bottom, and thrust bearings is not practicable and is without utility.

*Hopkins on Patents*, page 356, says:

"UTILITY IS INDISPENSABLE TO A VALID PATENT. This is established by the language of the patent act, Section 4886, R. S. U. S., expressly limiting its benefits to arts, machines, etc., which are both new and useful. Novelty and utility, both must concurrently exist, or the grant of a patent is a nullity."

See also:

*Mitchell v. Tilghman*, 86 U. S. 267,  
page 396, 22 L. Ed. 125, 137,

where the court says:

"Inventions, in order that they may be proper subjects of letters Patent, must be new and useful. Utility, in most cases, is a question of fact, as it usually depends upon the evidence resulting from actual experiment."

The fact that it never has been used though nearly seventeen years have now elapsed since its disclosure indicates its worthlessness.

*Robinson on Patents*, Vol. 1, Section 338:

"In order that an invention may be patentable, it must not only be bestowed upon the public by its inventor, but when bestowed it must confer upon them a benefit. The invention must, therefore, be useful, as well as new."

**3. The Claims Should Be Adjudged Invalid for Lack of Novelty, Invention and Utility; Claim 20 Also for Indefiniteness, Aggregation and Functionalism.**

Claims 9, 13 and 20 should be held void because the entirely closed casing of those claims is mechanically impossible, is without utility.

Moreover, unless the shaft casing of claim 9, read into claim 20, has the function of alignment as well as lubrication and protection, it differs in no respect from the prior art shown in the Fifth Circuit cases,—is without novelty.

The insertion of intermediate bearings in a closed shaft casing to give it the function of alignment was not invention in view of the prior art, and was anticipated by Byron Jackson.

Claim 9 also contains in combination the useless “jointed” shaft.

Claim 13 also contains in combination the useless adjunct, the “air vent” for forcing in air to eject spent fluid.

Claim 20, which is the only one that has survived of the 22 claims granted, is indefinite, and,

as hitherto construed to include the shaft casing, is functional and a mere aggregation. In any event it is anticipated by Byron Jackson who had the Pabst pump installed and running before this claim 20 was proposed to the patent office.

The claims should be adjudged invalid.

Respectfully submitted,

DAVID P. WOLHAUPTER,

*Amicus Curiae.*

RAYMOND IVES BLAKESLEE,

CHARLES C. MONTGOMERY,

*Of Counsel.*

# In the Supreme Court of the United States

OCTOBER TERM, 1922.

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No. 278.

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LAYNE & BOWLER CORPORATION,  
*Petitioner and Plaintiff,*

*vs.*

WESTERN WELL WORKS, ET AL.,  
*Respondents and Defendants.*

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## MOTION FOR LEAVE TO APPEAR AS AMICUS CURIAE AND BRIEF THEREON.

TO THE SUPREME COURT OF THE UNITED STATES:

And now comes David P. Wolhaupter and respectfully moves before this Honorable Court that an order be entered granting leave to file an appearance and brief and to present an oral argument in the above-entitled case as *amicus curiae* on behalf of the American Well and Prospecting Company, et al., defendants in the case of Layne & Bowler Corporation vs. American Well and Prospecting Company, et al., now pending in the United States District Court for the Southern District of California, Southern Division, and involving the same patent as is involved in the above-entitled case, to wit, patent No. 821,653.

This motion is based on the following grounds:

## I.

That Layne & Bowler Corporation, plaintiff and petitioner in the above-entitled case, brought an action against the American Well and Prospecting Company, et al., in the Southern District of California, Southern Division, on the 18th day of November, 1919, alleging infringement by the defendants of said patent No. 821,653. The said case was referred to the late Honorable Lynn Helm, as Special Master in Chancery to hear and determine. The trial commenced January 2, 1920, and continued from time to time until July 13, 1920, when the Master made and filed his report after some forty days of actual trial, finding the patent valid and infringed as to one form of structure previously manufactured by the defendants, and non-infringed as to a second form of structure adopted by defendants at a later date. As to said second form contempt proceedings were brought for violation of a temporary restraining order theretofore made by the Court. Said contempt proceedings were adjudicated in favor of the defendants who were entirely purged of contempt. Said case is still pending on exceptions to the Master's report by all parties.

## II.

That subsequent to the filing of the Master's report in the case of Layne & Bowler Corporation vs. American Well and Prospecting Company, et al., above set out, the plaintiff brought on for trial in the Northern District of California the case now pending on *certiorari* before this Honorable Court, to wit, the case of Layne & Bowler Corporation vs. Western Well Works,

et al., and the same after a four-day trial was decided in favor of plaintiff, finding the defendants' structure to be an infringement. Defendants in the case pending in the Southern District of California took no part in the trial or preparation of the case tried in the Northern District, nor were they heard as *amici curiae*.

### III.

That the defendants in the case last above mentioned in the Northern District of California prosecuted an appeal to the Circuit Court of Appeals, Ninth Circuit. That plaintiff urged and obtained a delay of hearing the exceptions to the Master's report in the Southern District pending the final determination of the Western Well Works case in the Circuit Court of Appeals.

### IV.

That defendants in the Southern District case thereupon had their counsel obtain leave to file briefs and argue orally as *amici curiae* in the Northern District case in the Circuit Court of Appeals, Ninth Circuit.

That defendants' counsel in the Southern District prepared and filed briefs and made an oral argument in the Northern District case in the Circuit Court of Appeals, Ninth Circuit, and thereafter said Court rendered its decision reversing the trial court following in the main the contentions and points of the *amici curiae*.

### V.

That defendants in the Southern District then vigorously urged the hearing of the exceptions to the Mas-

ter's report in said Southern District case, but plaintiff's counsel opposed said hearing on the ground that he had filed a petition for *certiorari* in the Supreme Court of the United States and the matter was delayed over defendant's strenuous objections, until the Supreme Court's determination of the petition for *certiorari*.

## VI.

That upon the granting of the petition for *certiorari* defendants' counsel again urged the hearing of the exceptions, setting out among other things that the determination of the case in the Supreme Court would not change the result or the ruling as to the exceptions to the Master's report, inasmuch as the Master's report was based upon points decided in the case of *Getty vs. Layne*, decided in the 5th Circuit, 262 Fed. R. 141, which points were subsequently followed in the 9th Circuit Court of Appeals in *Western Well Works Inc., et al., vs. Layne & Bowler Corporation*, 276 Fed. R. 465, the present case on *certiorari*.

That the District Court in the Southern District, without going into the merits of this contention, manifested extreme reluctance to hear the exceptions to the Master's report until the determination of this case in the Supreme Court.

## VII.

That the defendants in the Southern District case urge the necessity of their counsel as *amici curiae* assisting the Supreme Court to a speedy and proper adjudication of the patent because of the expressed



intention of the District Court of the Southern District to follow the decision of the Supreme Court as to the interpretation and scope of the patent involved in both suits, and because there are several structural differences between the defendants' structure in the Northern District and the defendants' structure in the Southern District, which make it important to obtain a proper determination of the scope and effect of the patent (if indeed the claims of the patent in suit be found valid at all).

#### **Suggestion As to Argument.**

Movent also suggests that this Honorable Court entertain his motion to be made at or prior to the oral argument of this case, for the admission of his California associates, to wit, said counsel for defendants in the Southern District case and who appeared and filed briefs as *amici curiae* on said appeal in the Circuit Court of Appeals and made oral argument therein, namely, Raymond Ives Blakeslee, Esq., and Charles C. Montgomery, Esq., and Movent will move the Court for leave for said counsel to participate in the oral argument in this Court, in order that this Court may have an opportunity to hear and interrogate said counsel, as may be desirable.

DAVID P. WOLHAUPTER,  
*Amicus Curiae.*

Dated August 28, 1922.

IN THE SUPREME COURT OF THE UNITED  
STATES.

OCTOBER TERM, 1922.

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No. 278.

---

LAYNE & BOWLER CORPORATION,  
*Petitioner and Plaintiff,*

*vs.*

WESTERN WELL WORKS, ET AL.,  
*Respondents and Defendants.*

---

**NOTICE OF MOTION FOR LEAVE TO APPEAR AS  
AMICUS CURIAE.**

To Frederick S. Lyon, William K. White, and Leonard S. Lyon, Solicitors and Counsel for plaintiff and petitioner on *certiorari*, and Charles E. Townsend, William A. Loftus and Frederick D. McKenney, Solicitors and Counsel for defendants and respondents on *certiorari*:

You and each of you will please take notice that at the opening session of the Supreme Court of the United States, October Term, 1922, on the 9th day of October, 1922, or as soon thereafter as counsel can be heard, and in the Court room ordinarily occupied by said Court in Washington, D. C., I will present motion for leave to appear as *amicus curiae*, copy of which is

hereto attached, and pray the Court to make and enter to that end an order, copy of which is hereto annexed.

DAVID P. WOLHAUPTER.

Dated August 29, 1922.

Received copy of the foregoing notice and annexed motion and copy of proposed order, this 29th day of August, 1922, as to solicitors and counsel for petition on *certiorari*.

FREDERICK S. LYON,  
WILLIAM K. WHITE,  
LEONARD S. LYON,

*Solicitors and Counsel for Plaintiff  
and Petitioner on Certiorari,*

and this 30th day of August, 1922, as to Solicitors and Counsel for defendants and respondents on *certiorari*.

CHAS. E. TOWNSEND,  
WM. A. LOFTUS,  
FREDK. D. MCKENNEY,

*Solicitors and Counsel for Defendants  
and Respondents on Certiorari.*

FILED

JAN 29 1923

WM. R. STANSBURY  
CLERK

Number 278

# **In the Supreme Court**

OF THE  
**UNITED STATES**

OCTOBER TERM, 1922

**LAYNE & BOWLER CORPORATION,**

**Petitioner,**

**vs.**

**WESTERN WELL WORKS, INC. (a Corporation), RO-  
TARY DRILLING AND DEVELOPMENT COMPANY  
(a Corporation), STANLEY M. HALSTEAD, P. E.  
VAUGHAN and ALLEN W. ROSS,**

**Respondents.**

**ON WRIT OF CERTIORARI TO THE UNITED STATES  
CIRCUIT COURT OF APPEALS FOR THE  
NINTH CIRCUIT**

## **PETITIONER'S OPENING BRIEF**

**FREDERICK S. LYON,  
LEONARD S. LYON,  
312 Stock Exchange Building,  
Los Angeles, California,  
Solicitors and Counsel for Plaintiff-Petitioner.**

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# In the Supreme Court

OF THE  
UNITED STATES

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October Term, 1922

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LAYNE & BOWLER CORPORATION,

*Petitioner,*

VS.

WESTERN WELL WORKS, INC. (a Corporation),  
ROTARY DRILLING AND DEVELOPMENT COMPANY (a Corporation),  
STANLEY M. HALSTEAD, P. E.  
VAUGHAN and ALLEN W. ROSS,

*Respondents.*

No. 278.

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*On Writ of Certiorari to the United States Circuit  
Court of Appeals for the Ninth Circuit*

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PETITIONER'S OPENING BRIEF

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This case comes before this Court on writ of certiorari addressed to the United States Circuit Court

of Appeals for the Ninth Circuit, for the purpose of enabling this Court to review that Court's decree *reversing* an interlocutory decree of the United States District Court for the Northern District of California finding petitioner's (plaintiff's) Patent No. 821,653, dated May 29, 1906, valid and infringed as to claims 9, 13 and 20.

For convenience, in this brief we shall refer to the parties by their titles in the trial Court—your petitioner was plaintiff, and respondents defendants.

The United States Circuit Court of Appeals for the Ninth Circuit, which heard this case, was constituted by the Honorable William B. Gilbert, Presiding Circuit Judge, the Honorable William W. Morrow, Circuit Judge (now retired), and the Honorable Charles E. Wolverton, District Judge.

The case was tried in the District Court by the Honorable Frank S. Dietrich, District Judge. Judge Dietrich presided at the trial in open court. He heard the testimony of the witnesses, had the advantage of inspecting the various exhibits in connection with the giving of the testimony of the witnesses, took the case under submission, had before him extensive printed briefs, and, after extended consideration, rendered a careful opinion (Record, p. 887) sustaining the patent and finding infringement of Claims 9, 13 and 20 (the claims declared upon).

DECISION OF U. S. CIRCUIT COURT OF APPEALS BY A  
DIVIDED COURT

The majority of the Circuit Court (Circuit Judge Morrow and District Judge Wolverton) disagreeing with the minority thereof (Presiding Judge Gilbert), reversed Judge Dietrich's findings both as to *infringement* and as to *how the defendants' apparatus was constructed*. His Honor, Judge Gilbert, sustained Judge Dietrich's findings, and expressed, in a dissenting opinion (276 Fed., 477), his dissent from the majority opinion and decision.

We thus see that, by a divided court, the majority consisting of the Junior Circuit Judge and a District Judge, the findings of District Judge Dietrich (confirmed by the opinion of the Senior Presiding Circuit Judge) were reversed.

## LAYNE PATENT IN SUIT, CLAIMS 9, 13 AND 20, VALID

*However*, not only did Judge Dietrich find the patent in suit and Claims 9, 13 and 20 thereof, *valid*, but said Circuit Court of Appeals unanimously held and determined said patent and each of said claims, valid. This is clear from a reading of both the majority and minority opinions. This is distinctly admitted in respondents' brief filed in opposition to the petition for certiorari. See heading of said respondents' brief, page 3: "Decisions of 5th and 9th Circuits are in complete harmony as to validity of Layne patent"; under which heading, respondents say: "*As a matter of fact, all of the decisions affecting the*

*Layne patent have been uniform in holding said patent valid."* The majority of said Circuit Court of Appeals for the Ninth Circuit based their decision in this case, not upon any invalidity of the Layne patent or claims, but upon a narrow and strict construction of the patent, by limiting it to the exact construction shown in the drawings and described in detail in the specification, notwithstanding the adjudicated fact that the Layne invention "did accomplish a revolution in the well drilling industry," and filled a long-felt need in the deep well irrigating business, and was an invention of such merit as to be entitled to protection against a reasonable range of mechanical equivalents.

The Honorable Circuit Court of Appeals for the Ninth Circuit, by the majority opinion, reversed the findings of fact of Judge Dietrich:

1. As to how defendants' mechanism was constructed and operated, and
2. As to its infringement of Claims 9, 13 and 20 of the Layne patent in suit.

Judge Dietrich heard the testimony of the witnesses, and his decision of the facts as to how the defendants' pumping apparatus was constructed and how it operated, was conclusive. His findings were an adjudication of conflicting testimony. The majority of the said Circuit Court of Appeals declined to follow the rule of this Court, reiterated in *Adamson vs. Gilliland*, 242 U. S., 350, 353, that:

"Considering that a patent has been granted to the plaintiff, the case is pre-eminently one for the

application of the practical rule that, so far as the finding of the master or judge who saw the witnesses depends upon conflicting testimony, or upon the credibility of witnesses, or so far as there is any testimony consistent with the finding, it must be treated as unassailable. *Davis vs. Schwartz*, 155 U. S., 631, 636 (15 Sup. Ct. 237, 39 L. Ed. 289). The reasons for requiring the defendant to prove his case beyond a reasonable doubt are stated in the case of *The Barbed Wire Patent*, 143 U. S., 275, 284 (12 Sup. Ct., 443, 450, 36 L. Ed., 154)."

Not only are Judge Dietrich's said findings of fact *as to the construction and mode of operation* of defendants' pumping apparatus conclusive and unassailable, because not only fully supported by competent evidence, but because they are the determination of the trial Court of conflicting testimony—but such findings of fact have the direct affirmation of the Presiding Circuit Judge, in his dissenting opinion in this case. Necessarily, if the majority of the Circuit Court of Appeals is in error in reversing said findings of fact, it follows, the said majority opinion is not a decision of the issues of this case based upon the facts of the case. If said majority are wrong as to the mechanical construction and mode of operation of the defendants' pumping apparatus, presumptively such majority is in error as to its conclusion as to infringement.

The Layne patent in suit has many times been in litigation. It has three times been before the Circuit Court of Appeals for the Fifth Circuit. In each of these cases, its validity has been determined.

See

*El Campo Machine Co. vs. Layne*, 195 Fed., 83;

*Van Ness vs. Layne*, 213 Fed., 804;

*Getty vs. Layne*, 262 Fed., 141.

Said Circuit Court of Appeals for the Fifth Circuit has found, as did Judge Dietrich in the trial of this case, and as did Presiding Circuit Judge Gilbert in the Court of Appeals in this case, that the Layne invention was not a mere improvement in details of construction, but, on the contrary, the Layne invention was of a fundamental, generic character, did accomplish a revolution in the well-drilling industry, and was an invention of such merit as to be entitled to protection against a reasonable range of mechanical equivalents.

The majority of said Circuit Court of Appeals for the Ninth Circuit have fallen into the error of looking at the mechanical details and construction of the parts and elements of Mr. Layne's embodiment of his invention, and overlooking Mr. Layne's real invention. As said by this Court in *Smith vs. Nichols*, 21 Wall., 112:

"A patentable invention is a mental result. . . .  
The machine, process or product is but its material reflex and embodiment."

For the purposes of this suit, and *with a complete knowledge of Layne's generic invention*, the defendants searched the prior art and therefrom selected the numerous prior art patents introduced in evidence herein. These prior art patents disclose the progress

in this art from the year 1860 up to the date of Layne's application, filed on April 28, 1903. The earliest prior patent, that of Thompson, is dated November 13, 1860; the latest patents are those of Alvord, issued August, 1903. None of the courts before whom the Layne patent has been in litigation, have found in any one or all of these prior patents Mr. Layne's fundamental, generic invention. On the contrary, the novelty thereof has been repeatedly recognized by the courts. The Court of Appeals for the Fifth Circuit, in the *Van Ness* Case (213 Fed., 804, at p. 808), found that there was a long "*unfilled want*" for just such a well mechanism as that embodying Mr. Layne's generic invention. Defendants have proved that *forty-three (43) years of development* in this art, prior to Mr. Layne's invention, *had not filled such want*.

Prior to conceiving his invention early in 1902 (R. 860), Mr. Layne had been for many years engaged in the well business, commencing that line of work in South Dakota in 1883, and thereafter continuing the same in the States of Iowa, Minnesota and Nebraska, until he went to Texas in 1902 (R., 549).

Prior to the introduction of Mr. Layne's revolutionary invention, the general type of pump installation was one involving the digging of an open pit and the mounting of the pump on the bottom of the pit. The pit was necessarily of sufficient size to permit the well-diggers to go down into the pit and assemble the mechanism therein. In order to lubricate the bearings of the pump placed therein, it was

ordinarily necessary for man to go down into the pit for this purpose. Any repairs required must be made by man entering the pit. Sometimes individual pipes led from the surface of the ground to the respective bearings, so that lubricant might be delivered to the respective bearings. Such a pit construction is illustrated in "Plaintiff's Exhibit No. 2" (R., 915), reproduced on the opposite page.

#### THE LAYNE INVENTION

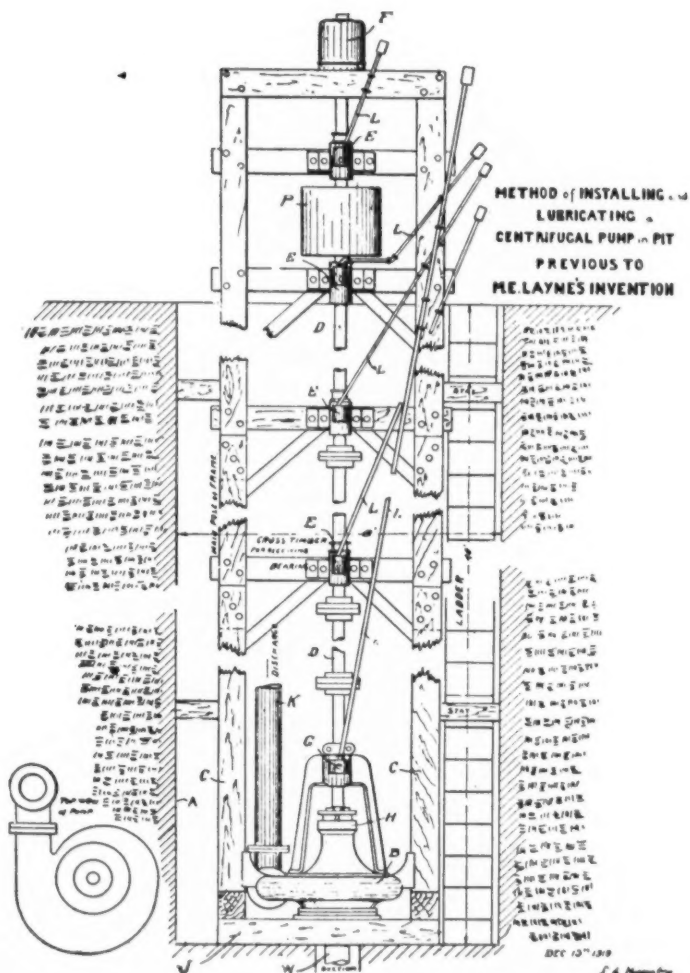
Mr. Layne had for years been installing pumps. He was thoroughly familiar with the dug pit installation—its dangers and inefficiencies. The problem, which confronted him and which he so successfully solved by his fundamental invention, was:

How could a mechanism be organized that would be efficient, practical and durable, and at the same time eliminate the necessity of man going down into the dug pit, and eliminate the necessity of the installation of the pump on the bottom of the pit or on the framework in the pit? How could he obviate—

- (1) the necessity of digging the pit, and thereby eliminate
- (2) the risk necessarily assumed by man due to
  - (a) Danger of caving while the pit was being dug or while the men worked in the pit boarding it up or installing the pump; and
  - (b) The risk of personal injury or loss of life (frequent with the dug pit construction) due



# Plaintiff's Exhibit No. 2.



to the necessity of man descending into the pit to lubricate, make necessary repairs, etc.?

- (3) How could he construct and assemble on the ground a pump structure of the necessary great length (Layne pump structures, 400 to 800 feet long, have been installed) and still be able to insert it in the small bore of a well?
- (4) How could he vary the length of such pump structure, after installation, in order to raise or lower it according to any variation in the level of the water in the well?
- (5) How could he protect the many necessary bearings for the long pump operating shaft so that the sand and other destructive detritus carried by the water being pumped would not cut out or destroy such bearings?
- (6) How could he assemble the bearings and pump shaft in proper relation and maintain the bearings in such relation without the necessity of man descending into the well hole?
- (7) How could he provide for the alinement of such a long pump shaft in the well?
- (8) How could he efficiently lubricate the many bearings required in such a structure?

The want of a pumping mechanism which would solve this problem had existed for years. The record proves that the problem was a real one. Mr. Layne saw the problem. As found by the Circuit Court of

Appeals of the Fifth Circuit in *Getty vs. Layne*, 262 Fed., 141, at p. 143, "The Layne patent . . . did accomplish a revolution in the well-drilling industry." Mr. Layne first conceived the idea of supporting the whole mechanism at the top of the well so that it would hang pendent, like a plumb-bob. He conceived assembling the pumping mechanism at the top of the well and lowering it into the well from the top. He conceived the idea that, as the pump was lowered into the well, unit after unit of the well mechanism could be assembled or added from the top of the well. That when the pump reached the desired depth, the assembled mechanism could be suspended from the top of the well, the entire structure could hang pendent like a plumb-bob. When repairs were required, the pendent mechanism could be pulled out of the well hole, bringing any portion thereof available at the surface of the ground. Thus, no entry of the well hole by man would be required.

Mr. Layne conceived the basic idea that such a well mechanism, to be practical, and, notwithstanding its great length, be capable of insertion into the small bore of a well, must be built up of many units, so that, *unit by unit*, the structure could be assembled at the mouth of the well bore, and, after the addition of each succeeding unit, be lowered a unit length into the well. This idea of assembling the pump and its mechanism at the top of the well, and inserting the assembled pumping mechanism into the well and supporting it pendent from the top of the well, was revolutionary. It *pointed* to a solution of the dug pit

problem. But Mr. Layne knew that such conception did not wholly solve the problem. It was only a partial solution. *It merely pointed out the right road to be traveled in order to reach the desired goal.* Many additional problems obstructed such road; *problems which had baffled all prior inventors in this art and had caused many to seek entirely different roads, leading only to failure,* as evidenced by the forty-three years' development of the art as shown by the prior patents in evidence, no one of which accomplished Mr. Layne's purpose or filled this long-felt want.

Some of these additional problems confronting Mr. Layne were:

(a) How could he provide the necessary bearings to keep the pump shaft in alinement?

(b) How could he insert and hold such bearings in such position along the shaft and hold them in alinement?

(c) How could he lubricate such bearings?

(d) How could he protect such bearings from the destructive action of the sand, etc., in the water being pumped?

All these things had to be provided for in such a manner that all parts of the well mechanism could be assembled, unit by unit, at the top of the well, and, when lowered into the well, would function properly without the necessity of man entering the well for any purpose whatsoever.

Without a solution of these problems, Layne's underlying idea of assemblage and installation from the top of the well, and of the pendent support, could not be realized. Confronted with these problems, Mr. Layne conceived enclosing the line or power-transmitting shaft in a conduit or shaft-enclosing casing. Mr. Layne further conceived that this shaft-enclosing conduit or casing could readily be made up in sections. That it was feasible to so enclose the line or power-transmitting shaft from the top of the pump to the top of the well. That such a shaft-enclosing conduit or casing could be made up of sections of any desired length. Here was the solution of the problem of bearings. Here was the solution of the problem of alining the bearings and keeping them in alinement. Here was the solution of the problem of protecting the bearings from the destructive action of the sand and detritus carried in the water being pumped. Here was the solution of the problem of lubricating these bearings. Mr. Layne conceived that this line shaft enclosing conduit or casing could be made the very means by which each one of these three necessary functions could be performed. He conceived that, by utilizing such a sectional enclosing conduit or casing, he had attained the very means for positioning the necessary series of intermediate bearings in place in alinement and for holding them in alinement. The bearings could be arranged at the adjoining ends of the sections of the shaft enclosing casing and supported by or as a part of the connectors which connected together the sec-

tions of such pipe or casing. This shaft-enclosing casing could be connected to the *water-discharge casing*, and thus form an integral structure adapted to be supported at the top of the well and hang pendent, like a plumb-bob.

The shaft-enclosing casing, *being an integral part of such pendent structure so hanging like a plumb-bob*, would thus be maintained in alinement and thus hold, *in alinement*, the shaft bearings and thereby the shaft.

By so mounting the many shaft bearings in such an enclosing casing, Mr. Layne was able to utilize such enclosing casing as a means of *protecting* the bearings from the destructive action of the sand, etc., in the water being pumped.

Mr. Layne also conceived the idea that this same shaft-enclosing casing could be utilized as the means *or conduit for conveying lubricant* to each of the bearings therein by providing for the feeding of the lubricant into the casing above the topmost bearing therein so that such lubricant would, by gravity, circulate or pass down between such bearing and the shaft and between each bearing and the shaft, thus lubricating all the bearings *in series*.

It is thus seen that Layne's conception was that the shaft-enclosing casing could be and should be made to perform the three functions of:

- (1) *Alinement* of shaft bearings.
- (2) *Protection* of shaft bearings from destructive

action of the sand, etc., in the water being pumped; and

(3) *Conduit for lubricant* for shaft bearings.

Having solved the problems of *alinement*, *protection* and *lubrication* by means of his shaft-enclosing casing, Mr. Layne was then in a position to carry out his underlying idea of a structure built up of units adapted to be assembled at the top of the well, and, when lowered into the well, to be supported from the top and hang pendent.

Such a structure, expressing and embodying Layne's *generic* invention, embraces:

A deep-well pump mechanism, adapted to be assembled, *unit by unit*, at the mouth of the well-bore and be successively lowered therein *a unit's length* after the addition of each succeeding unit and, when completely assembled and lowered, to *hang pendent* from the surface, like a plumb-bob; said mechanism consisting of, in combination:

- (1) A *pump* attached to a *sectional line or power* shaft extending to the top of the well.
- (2) A *pump* casing enclosing the pump impeller.
- (3) A *water discharge, sectional casing* connected to the pump casing and through which the pumped water passes to the top of the well.
- (4) A *sectional shaft-enclosing casing* extending from the pump casing to the top of the well

and said *shaft-enclosing casing* being adapted to:

- (a) Hold in *alinement* the line shaft by means of suitable *bearings* fixed within said casing at appropriate intervals.
- (b) To *protect* the line shaft and its bearings from wear or injury by any sand, grit or other bearing destroying detritus carried by the water being pumped; and
- (c) To form a *conduit for lubricant* from the top of the casing down through each succeeding bearing, including the lowest bearing, thus lubricating all said bearings *in series*.

To install such a structure, the *first unit*, embracing (a) the pump impeller casing, (b) the pump impeller therein, (c) a section of water-discharging casing, (d) a section of shaft attached to the pump impeller, and (e) a section of shaft-enclosing casing (having therein a shaft bearing) would be *assembled on the ground*, inserted in the well-bore and *held adjacent the mouth thereof* so that the *second unit* (embracing a section of water-discharge casing, a section of shaft and a section of shaft-enclosing casing, having therein a shaft bearing), could be joined to the *first unit*, whereupon such two units would be lowered about an unit's length into the well-bore and *there held* until the addition of a *third unit* identical with the *second unit*. The successive additions of



units, like the second unit, would then proceed until the desired length of structure had been assembled and lowered and the pump be at the desired depth in the well-bore, whereupon the whole structure would remain supported from the top of the well, hang pendent therein and function properly, *all without the necessity of man entering the well either to install, operate or repair the structure.*

The foregoing structure (*as so stripped of the various and sundry adjuncts and subsidiary non-essential features described in the Layne patent and covered by specific claims not in suit*) expresses and embodies Layne's *generic* invention covered by the *generic* claims 9, 13 and 20 herein held by Judge Dietrich and Judge Gilbert infringed by defendants' structure.

The said *generic invention* did not involve the inventing of any new mechanical elements. One of the chief merits thereof resides in the very fact that a *combination of elements*, expressing such *generic* invention, can be built up by the use of *standard* parts. In expressing such *generic* invention in *concrete* form, a mechanic can exercise a wide range of discretion and judgment in selecting, from the many well known and available forms thereof, for use in such a *concrete* expression, the particular design of pump impeller, the particular design of connection for the shaft sections, the particular design of shaft bearings, the particular design of coupling for the respective sections of the water discharge and the shaft-enclosing casings, the particular design of closure means for the bottom of the shaft casing, the particular design of

means for binding together, *into an integral structure*, the water discharge and shaft-enclosing casing, and so on.

In other words, Layne's *generic* invention is not inherent in or dependent upon the particular *form* of any one of said elements—it can be expressed in many different forms by the use of many different forms of its constituent parts or elements.

As said by the Circuit Court of Appeals for the Sixth Circuit, in *Yesbera vs. Hardesty Co.*, 166 Fed., 120, 125:

“The point to be emphasized is that the law looks not at the elements or factors of an invented combination as a subject for a patent, but only to the combination itself as a unit, distinct from its parts, . . . ”

This Court, in *Leeds & Catlin Co. vs. Victor Talking Machine Co.*, 213 U. S., 301, at p. 318, said:

“A combination is a union of elements, which may be partly old and partly new, or wholly old or wholly new. But, whether new or old, the combination is a means—an invention—distinct from them. . . . In making a combination, an inventor has the whole field of mechanics to draw from. This view is in accordance with the principles of the patent laws.”

It is thus apparent that Mr. Layne, having invented this broad, generically new combination, had the entire field of mechanics from which to select the details of construction of the respective parts or elements. His invention was not of a special form

or construction of any of these parts or elements, but, on the contrary, in the combination broadly. Many substitutes or "mechanical equivalents" existed for the several elements or parts. Mr. Layne's invention was the broad conception of such a generic combination.

The combination thus produced by Mr. Layne did not require a large diameter or wide-dug pit. It could be used in old wells where such pit existed, and thereby avoid man descending into the pit for any purpose, *or*, it could be used with equal advantage in the small diameter of a bored well, and avoid the necessity of providing a wide pit.

As said by Judge Dietrich in his opinion, Layne's invention is of a *fundamental, generic character*. This being true, Layne was entitled to cover and monopolize such generic invention by generic claims, not limited to the details of construction of the parts or elements and not limited to merely one species or form of his generic invention illustrated in his patent drawings or described in his specification. Mr. Layne complied with the patent laws when he showed in his patent specifications a form of his generic invention which would operate. He did not thereby limit himself to such specific form.

As said by this Court in *Hildreth vs. Mastoras*, 42 Sup. Ct. Rep., 20:

"It is not necessary, in order to sustain a generic patent, to show that the device is a commercial success. The machine patented may be imperfect in its operation; but if it embodies the generic principle and works, that is, if it actually and

mechanically performs, though only in a crude way, the important function by which it makes the substantial change claimed for it in the art, it is enough. *Telephone Cases*, 126 U. S., 1, 535, 8 Sup. Ct., 778, 31 L. Ed. 863; *Mergenthaler Linotype Co. vs. Press Publishing Co.* (C. C.), 57 Fed. 502, 505."

Although, as said by Judge Dietrich, Layne's invention, strictly speaking, was not a pioneer, nevertheless it was a *fundamental, generic* invention. As we shall point out hereafter, Claims 9, 13 and 20 are directed to this fundamental, generic invention, and are not limited to the particular mechanical form or shape of the elements.

As said by this Court, in *Winans vs. Denmead*, 56 U. S., 329, 341:

"It is generally true, when a patentee describes a machine, and then claims it as described, that he is understood to intend to claim, and does by law actually cover, not only the precise forms he had described, but all other forms which embody his invention; it being a familiar rule that, to copy the principle or mode of operation described, is an infringement, although such copy should be totally unlike the original in form or proportions. . . .

"Patentees sometimes add to their claims an express declaration, to the effect that the claim extends to the thing patented, however its form or proportions may be varied. But this is unnecessary. The law so interprets the claim without the addition of these words. The exclusive right to the thing patented is not secured, if the public are at liberty to make substantial copies of it, varying its form or proportions. And, therefore, the

patentee, having described his invention, and shown its principles, and claimed it in that form which most perfectly embodies it, is, in contemplation of law, deemed to claim every form in which his invention may be copied, . . . "

LAYNE'S PREFERRED FORM OF EMBODIMENT OF HIS GENERIC INVENTION, COVERED BY GENERIC CLAIMS 9, 13 AND 20, PLUS THE VARIOUS NON-ESSENTIAL ADJUNCTS ADAPTED TO BE USED THEREWITH AT THE OPTION OF ONE PRACTICING SAID GENERIC INVENTION.

A. ELEMENTS AND FEATURES EMBRACED IN EMBODIMENT OF LAYNE'S GENERIC INVENTION.

Having conceived his broad, generic "idea of means" or invention, it was then necessary for Mr. Layne to decide, according to his own judgment, upon the best *species* or *form* in which to express his generic "*idea of means*."

Every invention comprises an abstract "*idea of means*" expressed in concrete form. There is no idea that cannot be expressed in a number of ways, each expression thereof being the equivalent of every other expression of the same idea. This is universally true. For instance, the idea that an object is round can be expressed in a number of ways. The same idea may be expressed thus: Every point on the object's surface is equally distant from the center of the object. The same idea may be expressed in any of the foreign languages.

*It follows, therefore, that there can be no generic expression of a generic idea.*

This is true in connection with mechanical inventions. Where an inventor conceives an "*idea of means*," it is always possible to express said idea of means in many different concrete forms, each the equivalent of every other. This is true, no matter how narrow and restricted the idea of means may be.

It is, however, obvious that a broad, comprehensive generic "*idea of means*" can be expressed in a greater number of ways than can a narrow, restricted "*idea of means*." hence, the so-called rule of law that "*the range of equivalents varies with the scope of the invention.*"

As a matter of fact, said statement is not a "*rule of law*" but a "*law of nature*." Before any patent laws were ever enacted, it was true that a broad "*idea of means*" or, in other words, a *generic* invention, could be expressed in concrete form in more equivalent ways than could a narrow "*idea of means*" or specific invention.

Congress has recognized the existence of this "*law of nature*" that every invention can be expressed in many different concrete forms, each the equivalent of every other. We, therefore, find in Section 4888 of the Revised Statutes the following provision as to what an inventor must embody in his application for letters patent:

" . . . in case of a machine, he shall explain the principle thereof and the *best mode* in which he has contemplated applying that principle, . . . "

According to this section, an inventor is only required to describe, in his application for a patent, the "best mode" of embodying his "*idea of means*" in concrete form.

The Patent Office rules are to the same effect and the Patent Office does not require and does not permit an applicant to show, in his application, every possible form in which his invention can be embodied.

In view of the foregoing, an inventor need only show in his patent his *preferred form* of embodiment of his invention. When he has done this, he is entitled to *claim* his *actual invention* in whatever form it can be embodied.

Mr. Layne's *preferred form* of embodiment of his *generic* invention is illustrated in Figures 1, 2, 5, 7, 8 and 9 reproduced on the opposite insert.

Figure 1 discloses an exterior view of the *shaft-enclosing casing* 20, extending from the top of the well to the pump impeller casing 21, together with the *water-discharge casing* or outlet pipe 23. It will be noted each of these casings is made up of a number of *sections*. As said by Layne: "The outlet pipe 23 is also preferably made in sections to correspond with the sections of the pump shaft casing" (p. 2, l. 108).

It will be also noted that the *shaft-enclosing casing* 20 and the *water-discharge casing* or outlet pipe 23 are *bound* together to form an *integral structure* which is supported at the top of the well in frame work 24 and thus said *integral structure* hangs *pen-*

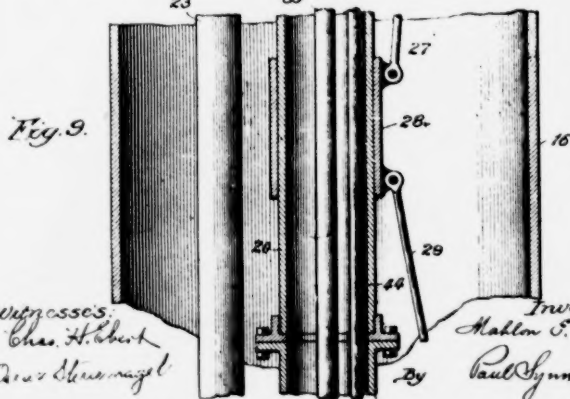
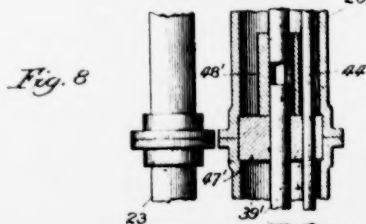
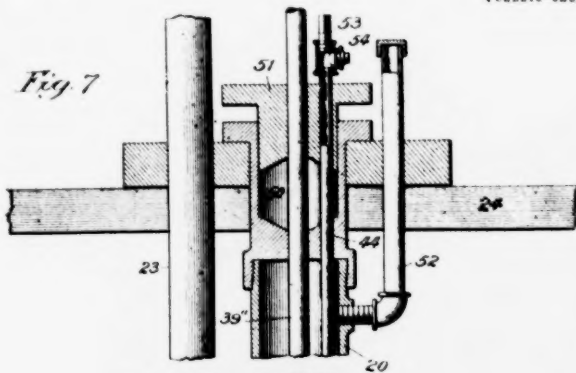
No. 821,653

PATENTED MAY 29, 1906.

M. E. LAYNE.  
WELL MECHANISM.

APPLICATION FILED APR. 28, 1903

4 SHEETS-SHEET 3



Witnesses:  
Chas. H. Hunt  
Oscar H. H. H. H.

Inventor:  
Maklon E. Layne  
Paul Symmetrecht  
Att. ym



M. E. LAYNE.  
WELL MECHANISM.

APPLICATION FILED APR 28, 1903.

4 SHEETS-SHEET 1

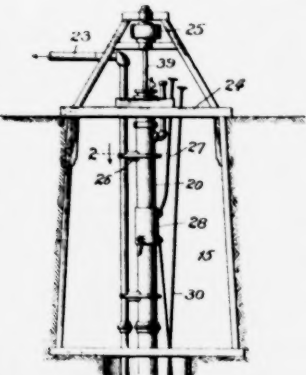


Fig. 2.

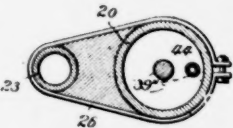


Fig. 1.

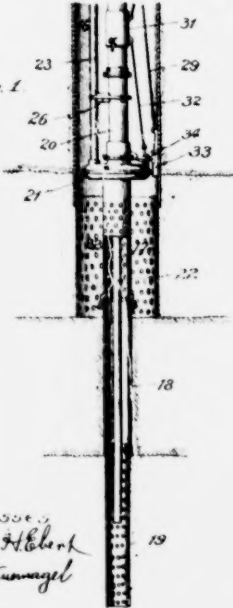
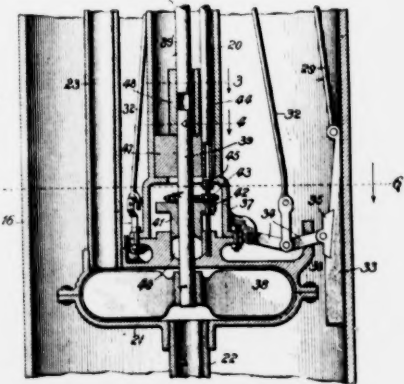


Fig. 5.



Witnesses  
Chas. H. Clark  
Geo. H. H. H. H.

*dent*, like a plumb-bob, in the well-bore which is lined with the casing 16.

As said on page 1 of Layne's patent, line 104:

"As shown in Figure 2, the shaft casing 20 and the outlet pipe 23, are *bound together* by means of the block-and-strap arrangement 26. These connecting devices are distributed at intervals along the length of the shaft casing."

In this Figure 1, a portion of one of the line shaft sections 39 is seen projecting from the top of the shaft casing and extending up to the drive-pulley 25.

In Figure 1, the water-discharge casing or outlet 23 is illustrated as eccentric to the shaft casing although, on page 2, line 124 of his patent, Mr. Layne states the water-discharge casing may be concentric with the shaft casing. This, however, is a mere matter of detail or form.

Also, in Figure 1, the pump mechanism is disclosed installed in connection with an old pit or chamber 15. Said pit serves no purpose and performs no function and Mr. Layne states, on page 1, line 88, that the well casing 16 may be extended to the surface and thus the pit of chamber 15, be dispensed with.

#### 1. ALINEMENT

Figures 7, 8 and 9 disclose the interior of the sectional shaft casing 20, including the sectional shaft 39' and the shaft bearings 47', respectively supported in the shaft casing at the respective ends of adjacent shaft casing sections.

As said shaft casing 20 is an *integral part* of the whole structure which hangs *pendent*, like a plumb-bob, the *shaft casing* itself will so hang and thus hold in *alinement* the shaft bearings mounted within the casing and thereby maintain the shaft in *alinement*.

The bearings are arranged at proper distances apart along the shaft to hold the shaft in alinement. These bearings are enclosed by and form, in operative effect, a part of the enclosing casing. This casing is a metal pipe. It holds these bearings in place and in line. Thereby the shaft is held from whipping.

The majority of the Court of Appeals erred in that they misunderstood the mechanical facts. They say:

"It seems clear to us that the alignment is not a function of the shaft-casing, but it is a function of the means used for suspending the apparatus from the top of the well."

This is clearly error. To whatever "means" the majority opinion may refer, it is obvious that these respective bearings, spaced apart along the length of the line or power shaft, can only be effected through the shaft casing. Even were it granted that alinement is ultimately secured by the fact that the whole apparatus is pendent, still the mechanical fact remains that it is by means of the shaft-enclosing casing (part of such pendent structure) that the bearings are directly held in alinement.

The majority opinion in this respect is opposed to the findings of Judge Dietrich, of Circuit Judge Gil-

bert and of the Court of Appeals for the Fifth Circuit in the *Van Ness* case, where it is said:

"The third function performed by the shaft casing of the (Layne) patent in suit is that of *aligning the bearings and the pump shaft* so as to keep the latter in a vertical position in the well."

We submit, therefore, that the majority opinion of the Circuit Court of Appeals for the Ninth Circuit is in error in its conclusion that Layne's shaft-enclosing casing does not perform the function of holding the bearings in alinement to keep the power shaft alined. Said majority opinion says:

"Our conclusion is that the shaft casing has only two functions: (1) To protect the shaft and its bearings from the water and sand pumped to the surface, and (2) To enclose the means provided for lubrication of the shaft-bearings. The function of alignment is, therefore, dismissed from further consideration."

This error of mechanics leads to an erroneous conclusion.

A mere inspection of the Layne patent drawing shows that the shaft casing is supported at the top of the well and that it is an integral part of the *means* for supporting and suspending every other part of the apparatus located below the top of the well.

In other words, the shaft casing and the water-discharge casing form an integral structure, which is supported at the top of the well and, therefore, by *reason of gravity*, said casings hang in a vertical

plane. As the shaft bearings are mounted in the shaft-casing, said bearings necessarily are held in vertical alinement. As the shaft passes through such vertically alined bearings, it, too, must be held in a vertical line.

In view of the foregoing facts which, to us, seem most apparent, we are at a loss to understand such finding to the effect that Layne's shaft casing does not hold, in alinement, the shaft bearings and thereby maintain the pump shaft in a vertical line.

We can only attribute such finding to Judge Morrow's confusion of the various and very differently functioning casing mentioned in the Layne patent specification. In this Opinion, Judge Morrow says:

"We find also that the combination with a 'pump casing' mentioned in clause 2 of claim 9, the 'closed casing surrounding the pump shaft' mentioned in clause 5 of claim 9, the 'sectional casing' mentioned in clause 4 of claim 13, the 'casing being closed at the top' in clause 8 of claim 13, and the 'well casing' of clause 2, claim 20, by which the pump is 'entirely closed off from the water in the well' mentioned in the last two words of clause 4 and in clause 5 of claim 20, perform the same function. . . ."

In said quotation, *three* separate and distinct casings, respectively performing entirely different functions, are spoken of as being *one and the same thing and performing the same function*.

The "pump casing," of Claim 9, is numbered 21 in the Layne patent and, as clearly shown in Figure 1, is the casing that encloses the pump impellers. Obvi-

ously, said casing is not closed off from the water in the well. In order to operate the pump, the well water is permitted to enter the bottom of said casing 21 and said water, by the rapid rotation of the impellers within said casing, is forced out of said casing and up through the water-discharge pipe 23 to the surface of the ground.

The "closed casing," of Claim 9, is the shaft-enclosing casing numbered 20 in the Layne patent. This casing is supported at the top of the well and hangs pendent therein, like a plumb-bob. So hanging in a vertical plane, it maintains in vertical alinement the shaft bearings mounted therein, and thus maintains the shaft in vertical alinement. This casing also forms a conduit down through which the lubricant passes and lubricates, in series, the said shaft bearings. This casing also prevents the water and sand therein from coming in contact with the shaft bearings and thus destroying them.

The "well casing," of Claim 20, is numbered 16 in the Layne patent and forms an inner lining for the well-bore to prevent caving in of the ground surrounding the bore of the well.

In the above quotation, his Honor, Judge Morrow, has erroneously treated these *three separate and distinct casings* as one and the same thing. Therefore, in construing Claims 9, 13 and 20, he has treated these three distinct elements thereof as being only one element. This confusion of these various elements may have been the reason for much of the conflict between the majority opinion of the Circuit

Court of Appeals for the Ninth Circuit in this case, and the various prior decisions of the Circuit Court of Appeals for the Fifth Circuit.

## 2. LUBRICATION

Pipe 52 is a means by which the lubricant can be fed into the shaft casing above the first shaft bearing therein. Such lubricant will, by gravity, flow or circulate down through such first bearing and through each succeeding bearing within the shaft casing and finally pass out of the casing, at the bottom thereof, and into the pump casing 21, thus lubricating all the shaft bearings, in series. In such series lubrication of all the bearings therein, the shaft-enclosing casing merely functions as a *conduit for the lubricant* which enters the upper end thereof and passes down there through and through each bearing therein.

In order that the lubricant may so flow, *by gravity*, down and through each of the bearings within the shaft casing, an air-vent is provided at the top of the casing. The reason for having such a vent or air opening in the casing above the lubricant is precisely the same reason as that which prompts the housewife, when drawing coal oil from the spout at the bottom of a five-gallon coal-oil can, to make a hole in the top of the can to admit air above the coal oil and thus equalize the air pressures above and below the oil. If this were not done, a vacuous or no atmospheric pressure condition would be created above the oil in the can as the oil level was lowered. As the oil, at the spout of the can, would be subjected to

full atmospheric pressure it is apparent the oil would not freely flow out of the spout if the top surface of the oil, in the can, were not likewise subjected to an equal atmospheric pressure. As defined in the Century Dictionary and Cyclopedia a vent is "The opening in the top of a barrel to allow air to pass in as the liquid is drawn out." In the Layne structure, air will pass into the casing either through the stuffing-box 50, at the top of the casing, or through pipe 52, if the cap thereon be only loosely screwed on the pipe. Of course, this is a mere detail requiring no explanation to one skilled in the art and attempting to practice the Layne invention as disclosed in his patent.

### 3. PROTECTION

Protection of the necessary bearings for the line or power transmitting shaft 39' is provided by the *enclosing casing or pipe 20*. Necessarily, there must be a large number of these intermediate bearings. Each is completely shut off by the surrounding casing 20 from the water being pumped, so that such water cannot enter such bearing and carry sand, etc., therein whereby such bearing will be quickly destroyed. By means of enclosing casing 20, each of these intermediate bearings is entirely closed against the entry of water and sand to the bearings. The bearings are thereby saved from the destructive action of sand, etc., in the water being pumped.

In Figure 7, a stuffing-box 50 is illustrated as a closure means for the shaft-enclosing casing 20 at



the top thereof. In Figure 5, a stuffing-box, 40, is illustrated as a closure means for the shaft-enclosing casing at the bottom thereof. According to the fact and, as is well known in the world of mechanics, a stuffing-box operates as a bearing and, when used in connection with a high speed rotating shaft, the stuffing material therein cannot be maintained in such close or compacted relation with the shaft as to prevent the passage of all liquid between the stuffing and the shaft. Like every other type of bearing, the stuffing *must be lubricated or it will heat and burn, thus being destroyed*. The majority opinion of the Court of Appeals in this case shows the inherent error in mechanics in presuming that such a stuffing-box would form a complete closure against any liquid moving therethrough in either direction. It is upon such theory that the decision of non-infringement of the majority of said Court is based. Such finding is against the mechanical facts. This is illustrated, for example, by reference to the testimony of Mr. Layne himself in this case:

"MR. LYON—Q. You have shown a stuffing-box over 41, Figure 5; with such a stuffing-box around a small rotating drive shaft, what condition of closure could be maintained?

A. Only loose closure.

Q. Please explain to the Court a little more fully what you mean by that.

A. Any packing gland that is sufficiently tight or closed against a shaft so that it absolutely shuts out the flow of lubricant, whether it be water or oil, through the same, usually burns and becomes inoperative; the consequence is we must leave the

packing slightly loose, so that a sufficient amount of either water or lubricant passes through the packing gland in quantities so that the same is lubricated."

Therefore, the lubricant, fed into the upper end of the shaft-enclosing casing, will circulate or flow down through each succeeding bearing therein *and a substantial portion thereof, if not all thereof, will pass through stuffing-box 40 into the pump casing 21.*

This is one of the mechanical facts found by Judge Dietrich, his finding being based upon a consideration of the oral evidence adduced before him in connection with the demonstration of the various exhibits. He had full opportunity to observe the witnesses, consider their testimony, and did, in fact, take part in the interrogation of the witnesses on this point, as shown with reference to the testimony of Mr. Layne above referred to. See, for example, R., p. 605. The reversal of this finding of fact by the majority opinion of the Court of Appeals is, we submit, a violation of the rule laid down by this Court in *Adamson vs. Gilliland (supra)*. Judge Dietrich says:

"It was undoubtedly Layne's desire and purpose insofar as possible to exclude the water from the shaft casing, *but perfect mechanical inclosure of the shaft is, of course, unattainable*; it must protrude from the stationary casing to connect with the rotating propeller, at a point where the pressure of the water is the greatest, *and a bearing at that point so close fitting as to entirely exclude the water could not be lubricated, and hence would be impracticable.* The provision made by the patent is for a long bearing equipped with a

stuffing-box, which, in conjunction with the down pressure of the oil in the casing, serves under ordinary operating conditions, as an effective barrier to the sand, if it does not entirely exclude the water." (*Italics ours.*)

As said shaft casing encloses the shaft and its bearings from the pump casing to the top of the well, it will be noted the only passage, through which the water being pumped and the detritus therein can enter the shaft casing, is the passage from the pump casing up along the shaft through stuffing-box 40 and between the shaft and the lowest bearing 47 in the shaft casing.

Any *upflow* of such water and detritus through such passage will be effectually obstructed by the said bearing and the stuffing-box and by the *downflow* of oil therethrough. It is thus apparent that Layne's shaft-enclosing casing, *in co-operation with the downflow of oil therein*, performs the function of *protecting the shaft bearings from the destructive action of the sand and other detritus* carried by the water being pumped.

The foregoing elements and features constitute Layne's preferred form of embodiment of his *generic* invention.

The said elements and features constitute Layne's broad and revolutionary contribution to the art and form the basis for the wonderful commercial success of the Layne invention.

*The said elements and features constitute a complete, operative structure.* No other element, no ad-

junct and no subsidiary feature, described in the Layne patent, is essential to the operativeness of the above-described combination as an expression of Layne's *generic* "idea of means."

Therefore, *all the elements and features*, embraced in an embodiment of Layne's *generic invention*, may be described as follows:

#### ELEMENTS AND FEATURES EMBRACED IN EMBODIMENT OF LAYNE'S GENERIC INVENTION

A deep-well pump mechanism, adapted to be assembled, *unit by unit*, at the mouth of the well-bore and lowered, *unit by unit*, into the well-bore and, when completely assembled and lowered, to hang *pendent* from the surface, like a plumb-bob; said mechanism consisting of, in combination:

- (1) A *pump impeller* attached to a
- (2) sectional *line or power shaft* extending to the top of the well;
- (3) a *pump casing* enclosing the pump impeller;
- (4) a *water discharge sectional casing* extending from the pump casing to the top of the well and said *shaft casing* being adapted to;
  - (a) hold the line shaft in *alinement* by means of suitable bearings fixed within said casing at appropriate intervals;
  - (b) *protect* the line shaft and its bearings from

the destructive action of the detritus carried by the water being pumped;

- (c) form a *conduit for lubricant* from the upper end thereof down through each shaft bearing therein.

B.—VARIOUS NON-ESSENTIAL ADJUNCTS ADAPTED TO BE USED THEREWITH AT THE OPTION OF ONE PRACTICING LAYNE'S GENERIC INVENTION.

"*The Layne patent . . . did accomplish a revolution in the well-drilling industry,*" said the Court of Appeals for the Fifth Circuit. (*Getty vs. Layne*, 262 Fed., 141.)

It is quite natural, therefore, that when making such a revolutionary invention and launching it on uncharted seas, Mr. Layne should endeavor to provide for every possible contingency that might arise in connection with the operation or use of mechanism embodying his invention.

He could not foresee all the conditions of all actual uses; he could not foresee all that the public might or might not require or desire in respect to his radically new instrumentality.

Out of abundance of caution, Mr. Layne, therefore, devised many subsidiary features and adjuncts adapted to be used in practicing his *generic* invention. However, the use of same is purely optional. Mr. Layne's *generic* invention is not dependent on said adjuncts, *either for operativeness or novelty*.

The said adjuncts are only adjuncts and nothing

more. They are adapted to perform functions subsidiary to the major functions performed by an embodiment of Layne's *generic* invention.

The elements and features, constituting said adjuncts, are respectively covered by *specific* claims not sued on herein. None of the infringers of Layne's patent have seen fit to appropriate said adjuncts and, therefore, the *specific* claims, covering them, have not been litigated.

Defendants' counsel seem to derive much comfort from the fact that defendants have not also appropriated Layne's said adjuncts. This fact is true, we presume, simply because defendants find that their embodiment of Layne's *generic* invention is a commercial success without the presence of such subsidiary features.

Defendants' counsel state said additional features or adjuncts "were actually abandoned as commercially impractical." There is not a scintilla of proof on this point other than Mr. Layne's testimony to the effect that said adjuncts were not used simply because they were not essential to the *commercial* success of his *generic* invention.

In other words, said adjuncts are not impractical for performing the subsidiary, additional and minor functions intended to be performed by them but the public does not require that Layne's apparatus embody such *additional* features. His apparatus, *stripped* of such additional features, meets with public favor and, therefore, there has been no occasion to encumber it with said additional features, provided by him to

take care of certain minor conditions of possible use. In other words:

Layne "builded better than he knew."

As indicating the comprehensive scope of Layne's *generic* invention and as showing the objects attained thereby and by the many adjuncts and subsidiary features adapted to be used at the *option* of one practicing such generic invention, we quote as follows from page 1, line 8 of the Layne patent:

"My invention relates to the apparatus used for drawing water from driven or artesian wells, and particularly to the means for adjusting a pump therein. The objects of the invention are, to provide means by which the piping and the pump may all be assembled in proper shape before inserting it into the well; to provide means by which a pump may be placed in any desired position in a well, centered, raised or lowered and fixed in position by manipulating from the outside entirely; to provide means for adjusting the length of the piping leading from the pump to the surface at will and to lower the pump from time to time without taking it out of the well; to provide improved means for centering and fixing the pump in proper position in the well-casing; to provide improved means for manipulating the packing of the pump-shaft, and proper adjustment of the pump in place by means at the surface of the ground; to provide for the proper action of a pump without stopping up the well, so that water may be either flowed into or pumped out of the same at pleasure; to provide a superior mounting for a centrifugal pump in the well manipulated from the surface of the ground; to provide an extensible pump-shaft separately supported at intervals along its

length; to provide an automatic centering device for the pump in the well; to provide for mounting the pump and the shaft in a closed casing which is open to operate from the top; to obviate the necessity of making large wells for descending into them in order to arrange the pump, and to generally improve and cheapen the apparatus used for the above purposes.

"The above objects, as well as other advantages which will hereinafter appear, I attain by means of the construction and assemblage of parts as illustrated in *preferred* forms in the accompanying drawings, . . ."

In addition to the *automatic centering* of the pump structure within the well, by hanging said structure from the surface, like a plumb-bob, Mr. Layne also provides, as additional adjuncts, the wedges 33. These are adjuncts, pure and simple, and Layne refers to the use thereof as being optional (p. 2, line 105). They were not present in the respective structures heretofore adjudged to infringe Layne's *generic* claims.

Another Layne *adjunct* is one *not* intended to be utilized during the operation of the pump. Out of abundance of caution, Mr. Layne provided means whereby the shaft casing could, at intervals and if so desired, be cleaned out by the use of air forced into the tube, 52. During the normal operation of the pump, the lubricant would be fed into such pipe, 52. In order to make the compressed air effective in cleaning out the casing, it was deemed necessary to make the casing air-tight *during such cleaning operation*, which would necessarily be performed when the



pump was idle. *Of course, the casing cannot be kept air-tight during the operation of the pump.* In the feeding of the lubricant to the casing during the operation of the pump, air would enter therewith. Furthermore, the lower stuffing-box, 40, during operating periods, could not be maintained air-tight, *as the lubricant must pass down between the shaft and stuffing,* in such box, *in order to lubricate both, so the stuffing will not heat and thus be destroyed.* With the passage of lubricant between the stuffing and shaft, there would necessarily be a passage for air.

However, when the pump is idle and for the purpose of making the shaft-casing air-tight during the cleaning operation, the packing, in stuffing-box, 40, can be compressed and thus forced into closer relation with the shaft than is possible during periods of operation.

Also, during periods of idleness, the shaft-casing may similarly be kept air-tight for the purpose of maintaining the bearings in efficient lubricated condition. In respect to this feature, Mr. Layne says, at the end of his specification:

"I consider it of great *advantage also* to arrange the pump-shaft in a closed casing with stuffing-box at surface of ground at top of pump, so that by the use of the packing-boxes an air-tight chamber *can* be maintained, and water kept out of the casing, 20, *or* kept filled with clean liquid, *if desired*, thereby providing an efficient lubricating system for all bearings of the pump."

This paragraph of description sets forth and describes another ancillary feature or subsidiary invention *not inherent in or requisite to* Mr. Layne's *fundamental, generic* invention. It refers to a method by which the mechanism *can* be protected in a more nearly complete way than might be or has been found to be in most instances necessary. Where Mr. Layne's pumping mechanism was to be installed down in the well, where no one could get at it without pulling the whole structure up, and was to lie idle for material periods of time, it impressed itself upon Mr. Layne, that he should provide for every contingency, such as insuring these bearings effectual protection at all times, whether the pump was in actual operation *or* during possible long periods of idleness. It is to be noted in this connection, that in the *Van Ness* case, (213 Fed., 804, at 808), the Court of Appeals of the Fifth Circuit says:

"So it seems doubtful whether the defendant's pump-casing keeps the water from the shaft and bearings when it is not in operation, and the argument is that *in the rice country, where it is principally used, it remains out of service nine months of the year*. For these reasons, it is argued that the defendant's casing is not a closed one, even against water and sand. However, the record shows that protection against water and sand is afforded by defendant's casing to all but one of the bearings and to the shaft in the same degree as by that of the patented casing, at least during the period of the pump's operation, and that the protection afforded by defendant's casing is different only in degree from that afforded by the patented casing." (Italics ours.)

In the majority opinion of the Circuit Court of Appeals in this case, his Honor, Judge Morrow, has particularly referred (276 Fed., 471), to this paragraph of description and to this ancillary operation and invention. We submit that the majority of said Court, by this reference have shown their total misconception of Mr. Layne's fundamental, generic invention, and have inextricably confused in their minds and in said opinion, such fundamental, generic invention with the ancillary and subordinate improvements and inventions described by Mr. Layne in his patent and patented in other claims than Claims 9, 13 and 20. Mr. Layne, in his patent, showed and described a subordinate invention consisting of means by which the stuffing-box, 40, could be tightened or loosened from the surface of the ground. Evidently, this means was part of the means by which, when this ancillary or subordinate invention was to be utilized, the stuffing-box was to be closed down so tight that it could not be rotated without burning up, and, in such tightened up condition, would prevent the passage of air there-through. The very fact that Mr. Layne has provided this tightening means, (see Fig. 5 of drawings, and column 2, page 2, Layne patent specification, lines 66 to 81), we submit, conclusively shows that Mr. Layne, *as he has testified in this case*, never intended or thought that the stuffing-box, 40, could, *while the pump was in operation*, be set sufficiently tight to prevent the passage of fluid therethrough.

By "*clean liquid*," Mr. Layne evidently referred to oil. Now it is obvious that, *during periods of*

operation, Layne's shaft-bearings had to be lubricated. It will be noted, however, that said statement refers to two *alternative and optional conditions*. The *first optional condition* is that of maintaining the casing air-tight and keeping the water out. In such a condition, *with nothing but air in the casing*, the structure, necessarily, would *not* be in operative condition. The *second alternative and optional condition*, mentioned by Mr. Layne, is to keep the casing "*filled with clean liquid, if desired.*"

Certainly the use of lubricant, during operating periods, was not a *matter of option* but a *matter of necessity*. Yet in this paragraph, Layne refers to the *optional* use of a liquid within the shaft-casing. Such being true, such *optional* use could refer to only periods of idleness when one could keep the bearings in good lubricated condition, either, 1st, by keeping water out of the casing and relying on the lubricant adhering to the shaft and bearings after cessation of operations, to preserve same from corrosion, or, 2nd, by keeping the casing filled with clean liquid, "*if desired,*" thus providing for an efficient lubrication and preservation of the bearings during periods of idleness.

However, it is quite clear said paragraph merely expresses Mr. Layne's opinion as to the effect that he *considers* it of advantage *to be able* to maintain, in his apparatus, *one of the two alternative conditions* referred to. The creation of either of said conditions is, however, *a mere matter of option* and so specifically stated by Mr. Layne, who says, "*if desired,*" one

can do what he considers to be of advantage to be *able* to do. In said paragraph, Mr. Layne does not state that the shaft-casing, at any time, "*is*" kept air-tight or that it is necessary, at any time, to keep such casing air-tight. He merely says that he considers it "*also*" to be an advantage that said casing "*can*" (that is, at one's option) be kept air-tight for either of the purposes mentioned by him. In other words, the language used by him clearly characterizes such air-tight feature as being merely a non-essential adjunct. It must be obvious that the successful operation of Layne's revolutionary invention is not dependent upon any such minor feature as the compression of the stuffing in said stuffing-box, 40.

In the first place, the uncontradicted proofs show it would be impractical to maintain an air-tight joint between such stuffing and the shaft, when the latter is rotating during the pump's operation.

In the second place, the only result of not maintaining an air-tight joint, between the stuffing and the shaft, is the passage of lubricant therethrough. As said lubricant would have already performed its function of lubricating all the bearings within the shaft-casing, its escape therefrom would be *absolutely immaterial*. *There is no pretense to the contrary*. Furthermore, in passing down along the shaft through the stuffing-box into the pump-casing, such lubricant co-operates with the shaft-casing in preventing the entrance, into the shaft-casing, of the water being pumped and the detritus carried thereby.

In other words, such *outflow* of lubricant from

Layne's shaft-enclosing casing prevents any *inflow* of water and detritus in the opposite direction through the same passage. This is precisely what the Court of Appeals held *to be a fact* in the *Van Ness* case, where the Court said:

"... the oil is put in the apparatus at the top and passes (circulates) through the bearings from the top through the intermediate to the lower bearing, being retained for a time above each bearing and serving in this way not only to lubricate each bearing, *but also to help close the shaft-casing against the ingress of water and detritus.*"

It is obvious the downward flow and pressure of the lubricant in Layne's shaft-casing could not "*help close the shaft-casing against the ingress of water and detritus*" unless such lubricant was able to enter and pass down between the shaft and the lowest shaft-bearing and between the shaft and the stuffing in box, 40, along which passage, *alone*, the water and detritus would tend to enter the casing. In other words, the lubricant could not *obstruct* the ingress of water and detritus *up a passage-way*, unless the lubricant could flow *down such passage-way*.

It is, therefore, seen that the Court of Appeals' *finding*, in the *Van Ness* case, fully confirms the testimony of Layne herein to the effect that, during periods of operation, *only a loose joint* could be maintained between the stuffing in box, 40, and the shaft, thereby permitting the down-flow of lubricant from the shaft-casing into the pump-casing.

In view of said *finding of fact* and the said testi-

mony of Mr. Layne, it is apparent that the said paragraph, above mentioned, means that the shaft-casing "*can*" (at one's option) be kept air-tight, during periods when the pump is idle, thus clearly describing a non-essential adjunct. Even if it be assumed that said paragraph refers to operating conditions, nevertheless Mr. Layne makes it quite clear that such air-tight condition is purely optional by stating it "*can*" be produced, not that "*is or must be*" produced, by the *auxiliary* means described in his specification. On this point, Judge Dietrich said herein:

"It was undoubtedly Layne's desire and purpose in so far as possible to exclude the water from the shaft-casing, but perfect mechanical inclosure of the shaft is, of course, unattainable; it must protrude from the stationary casing to connect with the rotating propeller, at a point where the pressure of the water is the greatest, and a bearing at that point so close-fitting as to entirely exclude the water could not be lubricated, and hence would be impracticable. The provision made by the patent is for a long bearing equipped with a stuffing-box, which, *in conjunction with the down-pressure of the oil in the casing*, serves under ordinary operating conditions, as an effective barrier to the sand, if it does not entirely exclude the water . . .

"It is also earnestly insisted by defendants that the two systems are differentiated by the fact that their lubricating system is circulatory, while that of the plaintiff is static. In one or two of the decisions cited *supra* more importance is attached to this consideration than under the evidence here I have been able to accord to it. Under the facts

disclosed, the distinction is more apparent than real. *In both cases the oil is fed in at the top in substantially the same manner, and under the force of gravity traverses the entire length of the shaft-casing, lubricating all of the bearings in its course.* In the actual operation of the plaintiff's mechanism *there is necessarily some escape of thin oil through the bottom bearing;* for, as already explained, a perfect closure at this point cannot be maintained. Possibly a larger quantity will escape at the bottom of defendant's structure; but even there, it is to be borne in mind, the lubricant must traverse a bearing of considerable length before it reaches the groove, and to some extent its down-flow is resisted by the upward pressure of the water, which is only reduced and not wholly eliminated by the means described. Indeed, it is very probable that in both mechanisms a comparatively static condition is, under ordinary conditions, maintained at the lower end of the casing, due to the counter-action or counter-resistance of the columns of oil and water, one against the other" (R. 890; 894).

#### LAYNE'S GENERIC INVENTION SUMMARIZED

As said by Circuit Judge Gilbert in dissenting from the decision of the Circuit Court of Appeals in this case:

*"There can be no doubt that the appellee's invention did, as was said in the case of Getty vs. Layne (C. C. A.) 262 Fed., 141, 'accomplish a revolution in the well-drilling industry'. And while the invention may not be said to be of a pioneer character, it is, nevertheless, an invention of such merit as to be entitled to protection against a reasonable range of mechanical equivalents. In both the appellee's and appellants'*



mechanisms the oil is introduced at the top in substantially the same manner, and by gravity it traverses the entire length of the shaft, thereby lubricating all the bearings. In both there is some escape of oil through the lowest bearing. *The contention that the two systems are differentiated in that the appellee's lubricating system is static, while that of the appellants' is circulatory, is not sustained by the proofs.* In the appellants' mechanism, the shaft-casing being made impervious to water and packed with hard cup grease a distance above and below each bearing, the ingress of water is prevented, and the movement of the lubricating oil is impeded, so that there is no substantial difference in the operation of the two lubricating systems. Both use a closed casing surrounding the pump-shaft from the pump to the top of the well, the casing being sufficiently closed to allow the feeding of a lubricating fluid down through the same to the various bearing parts for the shaft therein. Both accomplish the same result by substantially the same means, operated in substantially the same way. The fact that the appellants' static lubricants are supplemented by the use of an emulsifying oil is unimportant. The fact that in the appellants' mechanism more oil escapes from the lowest bearing than in the appellee's is also unimportant. The ultimate disposition of the lubricant after its office is fulfilled is immaterial. These differences do not enable the appellants to appropriate the substance of the appellee's invention.

*"In brief, the evidence shows that the appellants, as does the appellee, use a deep well pump mechanism assembled unit by unit, and lowered into the well-bore so as to hang from the surface, the mechanism consisting of: (1) A pump-impeller attached to a sectional power shaft extending from the pump to the top of the well, and inclosed in*

*a casing; (2) a water-discharge sectional casing extending from the pump-casing to the top of the well; (3) a sectional casing extending from the pump-casing to the top of the well, provided at the end of each section with a fixed block, with bearings for the shaft closed at the top, the casing being adapted to hold the power-shaft in alignment by means of the bearings to protect the power-shaft and its bearings from injurious action of sand or soil in the water, and to form a means for conducting lubricant from the top down through each shaft-bearing. (Italics ours.)*

As said by District Judge Dietrich:

"As frankly stated by counsel for the defendants, the issue is a narrow one, 'the chief question being one of infringement,' and the task is to determine the nature and scope of the plaintiff's patent and compare it with the defendants' structure. The problem of the inventor was not a new type of pump or pump runner, but, broadly speaking, how to install an existing rotary type—preferably centrifugal—operate it, withdraw it for repairs, and replace it, without the necessity of a man entering the well. And, of course, to be practical, the device must, under ordinary operating conditions, be efficient and reasonably durable. Layne's conception was of a jointed or sectional mechanism, providing, when assembled, a driving shaft, connecting the pump-runner at the bottom of the well with the actuating power at the surface, a continuous enclosing casing for the shaft, and a conduit through which the water is pumped to the surface, the sections to be of any desired length and added one at a time as the pump is lowered in the well, the assembled mechanism finally to hang pendant from supports at the surface. He suggests that the driving-shaft and its casing may be carried upon the outside of the water conduit

or within, but in either case the two are to be attached together at intervals to give increased strength and rigidity. An ingenious provision by which the pump or propeller-casing may be wedged in and made immovable at any point in the well by operating a lever at the surface is covered in some of the claims, *but the feature is not a part of the generic idea, and is not presently involved.* In practice the wedging was found to be unnecessary and has never been used. *An essential part of the main problem was to provide bearings to hold the driving-shaft in alignment together with means for lubricating them and keeping them free from the sand more or less generally carried in the water.* In the inventor's conception, these three functions were to be performed by the shaft-casing. Reinforced by the conduit-casing to which it is attached and subject to the pull of the pendant weight, it would serve as a rigid footing for the requisite bearings. Being substantially water-tight, it would keep the sand out and at the same time serve as a conduit through which to furnish oil to the bearings. It was undoubtedly Layne's desire and purpose in so far as possible to exclude the water from the shaft-casing, *but perfect mechanical inclosure of the shaft is, of course, unattainable;* it must protrude from the stationary casing to connect with the rotating propeller, at a point where the pressure of the water is the greatest, *and a bearing at that point so close-fitting as to entirely exclude the water could not be lubricated, and hence would be impracticable.* The provision made by the patent is for a long bearing equipped with a stuffing-box, which, in conjunction with the down-pressure of the oil in the casing, serves under ordinary operating conditions, as an effective barrier to the sand, if it does not entirely exclude the water." (Italics ours.)

Plaintiff's expert, William A. Doble, Sr., summarizes the main patent in suit (R., p. 824) as follows:

"A. With reference to these points, the patent provides in combination a shaft-enclosing tube associated with the bearings, forming a conduit to furnish lubricant to the several bearings in series. It further provides a protection, in combination with the bearings surrounding the shaft and protecting the bearings and the shaft from the action of the water being pumped and any sand or detritus carried by the water. Furthermore, this combination provides a series of shaft-supporting and aligning bearings placed at suitable intervals between the ends of the shaft, making one combined structure, being a pendant power transmission to transmit power from the surface of the ground or the top of the well to a pump located within the bore of the well. That is, it provides in this combination a support and alignment of the bearings, a lubricating system for the bearings in series, and a protection of the shaft and bearings against the corrosive action of the water or any sand or detritus carried by the water."

#### INVENTION

"TO OBTAIN ABSOLUTE SIMPLICITY IS THE HIGHEST TRAIT OF GENIUS."

The extreme simplicity of Mr. Layne's solution of the various problems that confronted him, emphasizes the novelty of his conception and the high order of invention exercised by him. It is a well-known fact that progress, in every art, is from the *complex to the simple*. There is nothing so complex as abso-

lute simplicity. This is so generally recognized in the world of mechanics that the Circuit Court of Appeals for the First Circuit, in *Dececo Co. vs. Gilchrist Co.*, 125 Fed., 293, summing the matter up, said:

"To obtain absolute simplicity is the highest trait of genius."

As said by his Honor, Judge Gilbert, in *Kitchen vs. Levison*, 188 Fed., 659, Judges Morrow and Wolverton concurring:

"It is urged that the improvement which the appellee made on the prior art was simple and obvious. It may be conceded it was simple, but that fact alone does not deprive the invention of patentability. *There may be the highest form of invention in some of the simplest improvements on the prior art.*"

An "idea of means" or invention is not to be judged by the simplicity of any particular concrete expression thereof. Although a simplicity of expression is ever a desideratum and sometimes the chief merit of an invention, nevertheless an invention should be judged *by the results accomplished thereby* in furthering the interests of mankind.

Also, the fact that an "*idea of means*," or invention, may be expressed by making slight mechanical changes in prior art devices neither detracts from the merits of the invention nor necessarily tends to limit or narrow the scope or breadth of the inventive idea of means. By making a slight mechanical change

in an existing device, it frequently happens that failure is converted into success; that a *broadly new idea of means* is thereby expressed. The books are full of such instances.

"Slight changes in appearance may bring about radical changes in results. Invention is not to be slighted because the changes are slight."

In the case of *United States Fastener Co. vs. Bradley*, 149 Fed., 222, the Court of Appeals for the Second Circuit said:

"This Court has repeatedly upheld patents for similar improvements, the test being not the simplicity of the device, *but the difficulties overcome and the results accomplished.*"

Mr. Layne's changes in and additions to prior art devices brought about "*radical changes in results.*"

"*The Layne patent . . . did accomplish a revolution in the well-drilling industry.*"

said the Court of Appeals in *Layne vs. Getty, supra.*

Layne's invention and the scope thereof, are, therefore, not to be judged and measured in terms of *mechanical changes* from prior art structures, but "*in terms of principle of operation and results accomplished.*"

So judged and measured, it is apparent Mr. Layne made a broad, fundamental invention; disclosed to the world a broadly new "*idea of means*" capable of being expressed in many different forms and of accomplish-

ing radically new results and thereby "*accomplished a revolution in the well-drilling industry.*"

CONSTRUCTION OF GENERIC CLAIMS 9, 13 AND 20, HELD  
INFRINGED BY DEFENDANTS' DEVICE

The fundamental rule of claim construction is that a claim, if possible, should be construed to cover the *actual and entire* invention of the patentee. As said by Judge Hawley, in speaking for the Court, in *Los Angeles Art Organ Co. vs. Aeolian Co. et al.*, 143 Fed., 880, 885, Judges Gilbert and Morrow concurring:

*"The claims of a patent should be construed, where they reasonably may be, to cover the entire invention of the patentee; and where a patent contains several claims, some of which are limited to details, the others are prima facie, not to be restricted by insisting that they contain, as necessary elements, the particulars which are specifically covered elsewhere. The general rule is as stated by the Court in Risdon I. and L. Works vs. Trent, 92 Fed., 375, that 'infringement cannot be avoided by reading into a broad claim of a patent specific devices claimed in narrower claims of the patent.' See also Mast Foos & Co. vs. Dempster Co., 82 Fed., 327, 27 C. C. A., 191; Bresnahan vs. Tripp G. L. Co., 102 Fed., 899, 43 C. C. A., 48."*

The fundamental, generic combination, containing the essence of Mr. Layne's invention, is the subject matter of claims 9, 13 and 20 of the patent in suit. A simple reading of these claims is sufficient to show that the Commissioner of Patents did not require,

and that it was not Mr. Layne's intention, to confine his claim of invention or the scope of his patent either to the wedge system or to any of the other details of improvement. These claims are as follows:

"9. In well mechanism the combination with a pump-casing, of a rotary pump of a jointed pump-shaft and a closed casing surrounding the pump-shaft from the pump to the top of the well."

"13. The combination with a pump and its actuating shaft of a sectional casing therefor provided at each end of each section with a fixed block with bearings for the shaft, the casing being closed at the top and provided with an air vent."

"20. The combination of a well-casing, a rotary pump therein, and a line shaft for the pump entirely closed off from the water in the well."

In construing or interpreting these claims, it is essential to bear in mind the Layne invention to which they are addressed. For, as said in *Towne vs. Eisner*, 245 U. S., 418:

"A word is not a crystal, transparent and unchanged; it is the skin of a living thought and may vary greatly in color and content according to the circumstances and the time in which it is used."

and as said by the Circuit Court of Appeals for the Second Circuit in *Carlson Motor and Truck Co. vs. Maxwell Briscoe Co.*, 197 Fed., 309, at p. 315:

"The question is not one of nomenclature, but of mechanics, and relates not to the names given to the parts of the combination, but to the various functions they perform."



So, in construing or interpreting the claims of a patent, care must be taken to give effect to the objects and purposes of the patent statutes. As said in *Topliff vs. Topliff*, 145 U. S., 156:

"The object of the patent law is to secure to inventors a monopoly of what they have actually invented or discovered, and it ought not to be defeated by a too strict and technical adherence to the letter of the statute, or by the application of artificial rules of interpretation."

and in *Klein vs. Russell* (19 Wall., 433):

"The Court should proceed in a liberal spirit, so as to sustain the patent and the construction claimed by the patentee himself, if this can be done consistently with the language which he has employed."

Bearing in mind then that Mr. Layne's novel conception resided primarily in the enclosing of the line or power-shaft a conduit extending from the top of the pump to the top of well and that the function of such conduit was three-fold, towit: (1) to support and align the bearings and thereby hold the line or power-shaft in alignment; (2) to protect such bearings from the cutting or destructive action of sand, etc., carried by the water being pumped, and (3) to provide a conduit for lubrication of the bearings in series, each of these claims must be construed in the light of such fundamental, generic invention. Each element named in the claim must be so considered that it will have the functions and perform

such functions in accordance with Mr. Layne's conception. The combination, expressed by each of these claims, must be a combination of the named elements so that such elements will co-operate together to perform their respective functions in accordance with Mr. Layne's conception. When so considered and construed, each of these claims is clear and concise and their breadth apparent. When so construed they negative *any intention* upon the part of Mr. Layne in making them or of the Patent Office in allowing them *to limit such claims to non-essential features*.

As said in *Rubber Co. vs. Goodyear*, 9 Wallace, 788:

"A patent should be construed in a liberal spirit, to sustain the just claims of the inventor. This principle is not to be carried so far as to exclude what is in it, or to interpolate anything which it does not contain. But liberality, rather than strictness, should prevail where the fate of the patent is involved, and the question to be decided is whether the inventor shall hold or lose the fruits of his genius, and his labors."

As said by the Circuit Court of Appeals for the First Circuit in *Mossberg vs. Nutter*, 135 Fed., 95, at p. 99:

"In confining our attention too exclusively to a critical examination of the claims, we are apt to look at them as separate and independent entities, and to lose sight of the important consideration that the real invention is to be found in the specification and drawings, and that the language of the claims is to be construed in the light of what is there shown and described."

The Circuit Court of Appeals for the Sixth Circuit in *Stillwell-Bierce & Smith-Vaile Co. vs. Eufaula Cotton Oil Co.* et al., 117 Fed. 410, at p. 414, said:

"While it is the purpose of the statute to require the inventor to set forth the nature and extent of his patent, and it is not the province of the Courts to add to or take from a claim that which is not embraced within its language, nevertheless we may look to the specifications for the purpose of construing the language used in the claim. If this language includes an element only described in general terms, we may look to the specifications to ascertain its meaning. *Sochner vs. Range Co.*, 28 C. C. A. 317; 84 Fed. 182; *Lake Shore & M. S. R. Co. vs. National Car Brake Shoe Co.*, 110 U. S., 229, 4 Sup. Ct. 33, 28 L. Ed. 129."

The Circuit Court of Appeals for the Eighth Circuit, in *Brammer vs. Schroeder*, 106 Fed. 918, at p. 929, speaking of the interpretation of claims, says:

"It is true that neither they nor the specification can be read to expand the claim; but the specification and the drawings must be read together, and given their obvious force and meaning, for the purpose of determining what devices are pointed out and described therein. When the specification and drawings of this patent are so read, the extension of the driving shaft beyond the pinion so that it will engage with the flange on the cylinder, and every other mechanical device requisite to unite the essential elements of the combination claimed, and to make it complete and operative, are plainly pointed out and described."

In *American Sulphite Pulp Co. vs. Howland Falls Pulp Co.*, 80 Fed. 395, the Circuit Court of Appeals

for the First Circuit says that the claims and the specifications are to be read together, not for the purpose of enlarging the invention, as stated in the claims, but "for the purpose of better understanding the meaning of the claim and the extent of the invention, and the object of the inventor."

As said by this Court, in *Brooks vs. Fiske*, 15 How. 212:

"The claim, or summing up, however, is not to be taken alone, but in connection with the specification and drawings the whole instrument is to be construed together. But we are to look at the others only for the purpose of enabling us correctly to interpret the claim."

That the claims of a patent must be read in the light of the specification; that the specification may always be referred to to restrict, though not to expand nor broaden the claims. See *Anderson vs. Collins*, 122 Fed., 451, C. C. A., 8th Circuit.

Having before it a patent in which the words of the claims were general and indefinite, the Circuit Court of Appeals for the Seventh Circuit, in *Seiler vs. Fuller & Johnson Mfg. Co.*, 121 Fed., 85, at p. 89, says:

"To sustain the validity of Claims 1 and 2, it is necessary, therefore (*Westinghouse vs. Boyden Power Brake Co.*, 170 U. S., 537, 558; 18 Sup. Ct., 707, 717; 42 L. Ed., 1136), 'To refer back to the specification; not, it is true, for a slavish adoption of the identical instrumentalities therein described, but for the understanding of the essential and substantial features of the means therein illustrated.'"

That it is entirely proper, in interpreting the broad and general language in claims, to refer to the specification and confine the meaning of the language of the claim to such a combination and to such elements as will produce the desired result with the elements functioning in the manner of the inventor's conception is set forth in *Robinson on Patents*, Vol. II, page 498:

"In thus construing the claims of a patent by its descriptive portions, the scope of the claims may often be restricted, but can never be enlarged. The claims are based on the description, the invention secured to the patentee being always identical with or contained in that communication to the public; and therefore the interpretation given to the claims must limit them to the invention previously described, however wide and comprehensive they might otherwise appear."

In the case of *Anderson vs. Collins*, 122 Fed., 451 (*supra*), the patent related to a roller bearing and the tenth claim defined "*roller elements* located in the race formed thereby, *ball-separating devices* between the roller elements of the housing, for confining the roller elements." The prior art was such that the claim was anticipated unless the *roller elements* were construed narrowly to be *balls* and not wheels or cylinders, and unless the ball-separating devices were construed to be *rotating* ball-separating devices. The Court, in order to save the claim, construed the roller devices to be ball-roller devices, and the separating devices

to be rotating separating devices. The Court's statement as to this question is as follows:

"Much has been said in argument and written in the briefs to show that the tenth claim of the patent in suit is so broad and general in its terms that it covers devices in which the main bearing elements are cylinders or wheels, and in which the separating devices are not rotatable; and that, when it is read in this way, the combination it describes is anticipated by several of the patents to which reference has been made. But the claims of a patent must be read in the light of the specification which accompanies them. *The specification may always be referred to to restrict, though not to expand the claims.* And, when this tenth claim is read in the light of these familiar rules, its true construction limits it to a housing for the balls and the rotatable separating devices between them described in the specification; and when it is thus read no anticipation can be found in the prior patents."

The Court of Appeals of the Sixth Circuit (Lurton, Day and Severns sitting), has also enunciated the same principle very emphatically in the case of *Lamb Knit Goods Co. vs. Lamb Glove & Mitten Co.*, 120 Fed., 267. In that case the subject matter involved was a glove, and the prior art was such that, unless the glove was construed to be a *knit* glove, the claim was anticipated by the prior art. Claim 1 did not specify a *knit* glove or knit fabric, but read as follows:

"1. A glove formed of two blanks, the hand blank having finger pieces formed thereon, and narrowed at the point where the thumb is attached,

and of a uniform width from the thumb to the wrist, and the thumb blank having its upper portion knit goring, substantially as described."

The Court held that, in view of the specification and the drawings, the claim should be construed narrowly to refer to a *knit* fabric, such construction being given in order to save the claim from anticipation. The Court's statement in the case is as follows:

"It is the settled rule in patent law that claims must stand or fall as made (*Keystone Bridge Co., vs. Phoenix Iron Co.*, 95 U. S., 274, 278, 24 L. Ed., 344); but it is equally well settled that the claims of a patent are to be construed by reference to the specifications (of which the drawings form a part), and that such reference may be had, not for the purpose of expanding the claim, but for the purpose of defining it and limiting it to the description of the invention (*McClain vs. Ortmyer*, 141 U. S., 419, 12 Sup. Ct. 76, 35 L. Ed., 800; *Howe Mach. vs. National Needle Co.*, 134 U. S., 388, 10 Sup. Ct., 570, 33 L. Ed., 963; *Coupe vs. Royer*, 155 U. S., 565, 15 Sup. Ct. 199, 39 L. Ed., 263; *Tilghman vs. Proctor*, 102 U. S., 729, 730, 26 L. Ed., 279). And within certain limits the Courts are inclined to adopt this mode of construction when it is necessary, as in the present case, to save the patent from the objection that the claims are too broad. *Rubber Co. vs. Goodyear*, 9 Wall. 788, 795, 19 L. Ed., 566; *McClain vs. Ortmyer*, *supra*; *Coupe vs. Royer*, *supra*, 577; *Sochner vs. Stove Co.*, 28 C. C. A., 317, 84 Fed. 182."

This Court has squarely and unequivocally indicated that it approved of the doctrine of construing claims more narrowly than their terms, in view of the speci-

fication. *Carnegie Steel Co. vs. Cambria Iron Co.*, 185 U. S. 403. The process of the patent in suit in that case referred to the mixing of metal from blast furnaces, but the second claim said nothing about metal from blast furnaces, but merely specified "the art of mixing molten metals to secure uniformity of the same in its constituent parts preparatory to further treatment." The Court held that the specification should be referred to to ascertain the character of the metal, and that the metal should be construed to mean metal from *blast furnaces* and not from *cupolas*, there being considerable question, in view of the art, as to the validity of the claim if construed broadly enough to cover the mixing of metal from cupolas. We quote below the statements of the Court upon this point.

"The second claim apparently extends to the art of mixing all molten metals, but the specification, taken in connection with the disclaimer, which describes a process designed to dispense with the use of cupolas, shows that it was intended to include metal tapped from blast-furnaces and was probably intended to be limited to that. Whether the claim would be void if construed to include cupola metal, it is unnecessary to consider. *It clearly includes metal from blast-furnaces, and is not rendered void by the possibility of its including cupola metal. The claim of a patent must always be explained by and read in connection with the specification, and as this claim clearly includes metal taken from blast-furnaces, the question whether it includes every molten metal is as much eliminated from our consideration in this case as if it were sought to show that the word 'metal'*



*might include other metals than iron.* Were infringement charged in the use of an apparatus for mixing cupola metal, the question would be squarely presented whether the claim had been illegally expanded beyond the specification."

It will be noted from the foregoing language that the Court had no hesitation in referring to the specification and, in view of such specification, holding that the metal in the claim must be construed not only to mean metal *from blast-furnaces*, of which the claim made no mention, but also that it had no hesitation in construing such metal to be *iron*, although the claim made no specific mention of such limitation.

The same policy, as to construction, is set forth in a later decision, *Brill and The J. G. Brill Co. vs. The Washington Railway & Electric Co.*, 215 U. S., 527. Mr. Justice Holmes, who delivered the opinion, said:

"At the argument it was admitted that the plaintiff's case must stand or fall on claim 13 of No. 627,898. In that claim the only possible element of novelty is the mode in which the semi-elliptic springs are suspended from the side frames. *In practice the links are elastic and the pins on which the whole combination hangs have a universal ball-and-socket movement, although the claim only says 'movably and resiliently suspended substantially as described.'* Neither '*movably*' nor '*resiliently*' indicates the ball-and-socket arrangement, but it is described in the specification and we give the plaintiff the benefit of the doubt."

thus indicating the willingness of the Court to con-

strue the term "*movably*" to mean the ball-and-socket movement described in the specification.

The case of 1900 *Washer Co. vs. Cramer*, 169 Fed. 629, is on substantially all fours with the present case. In that case Judge Gray delivered the opinion of the Court (Dallas and Buffington sitting with him) and admitted that the terms of claim 1 of the patent in suit were fully met by the standard washer, or by the Wearne tub "*if we stick in the bark, by looking at the language of the claim, dissociated from the specifications; but no invention can be practically or fairly understood or explained, if such dissociation is absolutely adhered to*" (169 Fed. 632), but the claim was nevertheless held valid over such prior art which met it *in terms*. The Court held that the "means for actuating said lever," referred to in the claim, must not be taken to mean any means such as impractical hand power applied to the lever, but must be construed to be the "efficient practical means described in the specification."

The point to be emphasized is that, when a claim recites an element by a certain name, the Court will apply to the "specification," i. e., drawings and description, to give effect to the inventor's language in his claim. For example, if he calls for a "closed casing" the Court will ascertain for what operative function and result he includes a "closed casing" as a part of the combination claimed,—What its purpose in the combination is—How it performs its purpose

or function,—and, What is its operative relation to the other elements of the claim, in order that the claim may be interpreted to call for the invention sought to be patented to the end that the final meaning shall not “lose sight of the important consideration that the real invention is to be found in the specification and drawings, and that the language of the claims is to be construed in the light of what is there shown and described (*Mossberg vs. Nutter, supra*).

What then is the true meaning and scope of claims 9, 13, and 20?

#### CLAIM 9

In words claim 9 specifies that it embraces “in well mechanism,” “the combination” with

- (1) a pump casing of a rotary pump,  
of
- (2) a jointed pump shaft,
- (3) a closed casing surrounding the shaft from the pump to the top of the well.

In construing and understanding this claim, it is to be first noted that the combination is complete by commencing at the top of the pump and embracing the “well mechanism” “to the top of the well.” In other words, the active part of Mr. Layne’s invention was the mechanism for supporting the pump and “well mechanism” pendent from the top of the well to wit: the means suspending and operating the pump. The

claim embraces these means by denominating them "a jointed pump shaft" and "a closed casing surrounding the shaft from the pump to the top of the well."

The words "jointed shaft" clearly specifies a power shaft made up in sections joined together. The implication necessarily is present that the shaft is to be of such length that a one-piece shaft would be impractical. Hence this claim is by its terms "limited" to a combination in which the power shaft is composed of sections.

*Merely to surround such shaft between the top of the pump and the top of the well with a pipe would perform no useful purpose whatsoever. The law never presumes a futile thing.* Mr. Layne must have intended more than mere futility. When he used in this 9th claim the words "a closed casing" he intended and meant "a closed casing" *for the purposes and having the attributes and functions of the shaft enclosing conduit or casing 20 of his drawings and description.* Such "closed casing" combined the performance of the three purposes or functions of (1) supporting and aligning the bearing, (2) protecting the bearings from the sand, etc., carried by the water being pumped, and (3) formed a conduit for the lubrication of the bearings in series. And this is the kind of "closed casing" called for by the claim. It is thus apparent that this claim covers Mr. Layne's generic conception and combination.

As said in *Robbins Conveying Belt Co. vs. Ameri-*

*can Road M. Co.*, 145 Fed. 923, where the meaning of the language was in the claims of a patent is doubtful, or is susceptible of two different constructions, the specification and drawings may be properly referred to for the purpose of ascertaining the true construction of the claims, and as said by this Court in *Brown vs. Guild*, 90 U. S., 181:

"The first of these claims, if construed simply as claiming the placing of the seed-dropper on the machine, would probably be void, as claiming a mere result, irrespective of the means by which it is accomplished. But if construed as claiming the accomplishment of the result by substantially the means described in the specification, it is free from that objection; and we ought to give a favorable construction, so as to sustain the patent if it can fairly be done."

And in this latter case this Court further says:

"A literal construction is not to be adopted where it would be repugnant to the manifest sense and reason of the instrument."

When Mr. Layne in claim 9 specified as a part of the combination therein claimed "a closed casing," etc., it is clear that he meant the kind of a closing casing and a closing casing performing the function described in the specification. It is undoubtedly the meaning or interpretation which the courts will give to this language of the claim. Particularly is this true as thereby the claim will be made true to Mr. Layne's invention and the validity of the patent sustained

thereby instead of accusing Mr. Layne of specifying a mere enclosure of the power shaft without such enclosure having any beneficial function or result whatsoever.

#### CLAIM 20.

In claim 20 Mr. Layne has expressed his general combination in slightly different language. He calls therein for three elements: (1) a well casing; (2) a rotary pump therein; and (3) a line shaft for the pump entirely closed off from the water in the well. Again we must refer to the drawings and specifications for the purposes, attributes and functions of closing the line shaft from the water in the well. It is perfectly apparent that this was the problem before Mr. Layne in order to make his *pendent* conception successful. The claim, therefore, necessarily implies that the line shaft or power shaft of the pump shall be enclosed in a conduit of the kind and for the purposes set forth in the Layne invention as disclosed by the drawings and description of the patent. *That is to say, an enclosing conduit having the three functions heretofore adverted to.* It is to be noted, in this connection, that this claim differs from claim 9 in that the line shaft is not specifically referred to as jointed or sectional.

The purpose of this closure of the line shaft is inherent in the combination thus expressed in these claims. It is a closure for the three purposes or func-

tions of, (1) supporting and aligning the bearings; (2) sufficient closure to prevent the sand, etc., carried by the water being pumped from destroying the bearings; and, (3) sufficient closure to allow the feeding of a lubricant down through the enclosing conduit from bearing to bearing,—*series* lubrication. *Absolute closure is not essential nor is it mechanically possible to absolutely close the conduit at the pump neck from some water seeping through when the pump is idle. Such water, however, will be free from sand. Sand, etc., is only carried when the pump is in operation. Nowhere in Mr. Layne's specification has he insisted that absolute closure against water at all times must be or can be provided.*

*No intention is found in either of these claims to limit his claim of monopoly solely to the particular form or construction shown or described. No intention to limit his claim to the particular or identical form of elements illustrated in his drawings. Therefore, when referring back to the specification (drawings and description), "for the understanding of the essential and substantial features of the means therein described" the Court is not required to limit the claim to "a slavish adoption of the identical instrumentalities therein described" (Seiler vs. Fuller, 121 Fed. 85, supra), but will look at the real substance of the Layne invention in accordance with its revolutionary novelty and importance.*

As said by the Court of Appeals for the Seventh

Circuit, in *Columbia Wire Co. vs. Kokomo Co.*, 143 Fed. 116, 124:

"The object of the law authorizing the grant is to stimulate invention by this reward to the inventor. It must be administered in conformity with this liberal policy, as a wise exception from the common-law rule against monopolies. So the exclusive privilege of the patentee must be protected to the full extent of his invention and grant."

And as said by this Court in *Keystone Mfg. Co. vs. Adams* 151 U. S., 139.

"But when, in a class of machines so widely used as those in question, it is made to appear that at last after repeated and futile attempts, a machine has been contrived which accomplishes the result desired, and when the Patent Office has granted a patent to the successful inventor, *the Court should not be ready to adopt a narrow or astute construction, fatal to the grant.*" (Italics ours.)

#### CLAIM 13

In claim 13 Mr. Layne expresses his invention in slightly different language. It calls for "the combination with"

- (1) a pump and
- (2) its actuating shaft  
of
- (3) a sectional casing therefor, provided at each end  
of each section with a
- (4) fixed block with
- (5) bearings for the shaft



and adds the words of description of the casing, "the casing being closed at the top and provided with a vent."

The words of this claim definitely describe the fact that the enclosing casing or conduit is made up of sections. That at the end of each of its sections this casing or conduit supports and fixes in position a block or part which provides the bearing for the shaft. In construing this claim "the casing" must be interpreted to be "a casing" having the functions of the Layne invention, i. e., enclosure, alinement, protection and lubrication. The casing is to be closed at the top, i. e., the casing or enclosing conduit so formed *that the water being pumped may not run into the top and carry sand, etc., thereinto to destroy the bearings.*

The casing must also have a "vent" or air passage at the top thereof so that the lubricant may, by *gravity*, flow down from bearing to bearing. As before stated, such a "vent" operates precisely as a "vent" or air opening, made in the top of a coal oil can by the housewife to permit the flow of oil down within the can and out a spout at the bottom thereof. The term "*air vent*" has a *definite and precise* meaning and is defined in Knight's American Mechanical Dictionary as follows:

"The opening in the top of a barrel to allow air to pass in as the liquid is drawn out."

The reason, for allowing air to pass in the top of the barrel is to equalize the pressure above and below the liquid. If air were not admitted to the barrel at the top thereof, a vacuum condition would be produced above the liquid as the level thereof lowered. As the liquid, being drawn out, would be subjected to atmospheric pressure at the outlet hole, it would not flow freely unless such atmospheric pressure at such outlet were equalized and nullified by an equal atmospheric pressure above the liquid in the barrel, hence the necessity for making a small hole or air passage or "*vent*" in the top of the barrel to subject the top of the liquid therein to atmospheric pressure.

In the Layne structure, air can pass through the upper stuffing box 50 or into pipe 52, if the cap thereon be but slightly loosened or removed. As said before, this is but a small detail requiring no explanation to a mechanic. Layne's reference to the "*air vent*" is an ample disclosure of such feature to anyone skilled in the art.

It is contended that the "*air-vent*," referred to in claim 13, is the pipe 52 *when used*, if so desired and at one's option, as a pipe through which to *force* air into the casing for cleaning out the same when the pump is idle. Of course, when so used, the pipe 52 cannot be properly called an "*air-vent*," which is an opening to permit the passage of air *to equalize pressures*.

When speaking of said pipe 52, *as used* as an "*inlet*," through which *to force* air into the casing and

thus force out any objectionable material therein through the hollow rod 44, Layne *properly and accurately* designates such pipe *merely* as an "air inlet," and that is all it is during such *cleaning operation*.

*Claim 14* is the claim that covers the "*adjunct*" or *auxiliary* means provided for *cleaning out* the casing when the pump is idle. This is the subject described in lines 74-82, col. 2, page 3, of the Layne patent in suit, and misconstrued in the majority opinion of the Court of Appeals in this case, as hereinafter pointed out. In this claim 14, the hollow rod 44 *is made an element* and the pipe, through which the air is forced, is properly designated *merely* an "air inlet."

Thus we see, Layne was most accurate in his use of terms in describing these *two different features* in his *structure*—*one*, an "air-vent" performing its function during the operation of the pump; the other, an "air inlet" performing its function when the pump is idle and in connection with *a subsidiary adjunct* adapted to be employed *at one's option*.

Claim 13 cannot be construed as covering such *subsidiary cleaning means or adjunct* for the reason that it does not include one of the essential elements thereof, to-wit: the hollow rod 44 through which the material must be ejected, if said adjunct be utilized. Without such hollow rod, there would be no complete sub-combination capable of being utilized in the cleaning operation.

Furthermore, the fact Layne uses two different

terms "*air-vent*" and "*air-inlet*" shows he meant two different features. To construe these claims otherwise would be contrary to the ordinary rules governing the construction of written instruments.

Furthermore, it is apparent pipe 52 is adapted, at different times, to perform various functions. It may be used as an "*oil-inlet*," or as an "*air-vent*" or as an "*air-inlet*."

Obviously, when used as an "*air-inlet*" it is being utilized as a part of a minor adjunct—an auxiliary means or sub-combination provided to be used, at one's option and when the apparatus is idle, to clean out the casing and said sub-combination or adjunct is covered by another claim, to-wit, claim 14, where it is accurately and correctly called an "*air-inlet*."

However, even if claim 13 be construed as calling for pipe 52, as used as an "*air-inlet*" as well as an "*air-vent*," nevertheless one could not escape the charge of infringing such claim by merely not utilizing one of the functions or attributes of such element.

This proposition has been fully covered by decisions in the Ninth Circuit. Judge Cushman, in *Wilson vs. Union Tool Company*, 237 Fed. 847, has particularly ruled against any such contention. In that case defendant's device was held to infringe, although "defendant did not appropriate the perhaps relatively more important conception of Wilson" (top of page 854). Judge Cushman said "this does not excuse it,

or take from the infringement it has practiced" (page 854). And at page 855, he says:

"The forked formation of complainant's reamer body was essential to the complete collapse of the cutters; but it was not essential to the co-action in the particular in which infringement is found. The fact that, in describing, in the claims, a member of a machine which performs two functions in such a way as to disclose a feature of its fitness to perform one function, which feature is not essential to the discharge of its other function, does not warrant competitors in dropping such feature and thereby appropriate one-half of the invention and its advantage, nor prevent the Court from according the patentee such a range of equivalents as will fairly protect him in the substantial merits of his invention. If so, form becomes everything, and substance nothing."

Judge Cushman's decree was affirmed by this Court in *Union Tool Company vs. Wilson*, 249 Fed., 736. In that opinion, Judge Hunt, Judges Gilbert and Ross concurring, said:

"The fact that the appellant has not used *each attribute* of the Wilson invention cannot excuse it from being held to infringement. The *Paper Bag Case*, 210 U. S., 405; 28 Sup. Ct., 748; 52 L. Ed., 1122; *Stebler vs. Riverside Heights Association*, 205 Fed., 735; 124 C. C. A., 29; *Parker vs. Automatic Machine Co.* (D. C.), 227 Fed., 451; *Jackson Fence Co. vs. Peerless Fence Co.*, 228 Fed., 691; 143 C. C. A., 213; *Walker on Patents*, Sec. 350."

THE RANGE OF EQUIVALENTS VARIES WITH THE SCOPE  
OF THE INVENTION

The above-mentioned statement is often referred to as though it were a *rule of law*. However, it must be apparent that it is not a *rule of law*, but a *law of nature*. Any broad idea can be expressed in more equivalent ways than a narrow idea. A broad inventive "*idea of means*" can be expressed in more equivalent forms than can a narrow inventive "*idea of means*." Therefore, *it is a fact*, not a rule of law, that the range of equivalents varies with the scope of an invention—the broader the invention, the greater the range of equivalents.

The larger a bucket is, the more water it will hold. The broader an invention is, the greater the range of equivalents.

Such a *fact* observation or generalization does not, however, aid a court, in any particular case, in determining the range of equivalents to be accorded an invention involved in the case. In the same way, the fact observation that: the larger a bucket is, the more water it will hold, does not aid anyone in determining the amount of water any particular bucket will hold.

The question of infringement is a question of *substantial identity*. To determine such question, the first fact to be determined is just what was the patentee's contribution to the art. What was his novel abstract "*idea of means*"? Having determined the exact metes and bounds of such contribution or "*idea of means*,"

one is then in a position to determine whether or not the defendants' device expresses such "*idea of means*." If it does express the same, but in a "*form*" differing from the "*form of expression*" disclosed in the patent, then, of course, the *elements*, employed by the defendants in expressing such "*idea of means*," are necessarily within the *range of equivalents* to be accorded the patentee's invention.

We respectfully submit, therefore, that one cannot fix the "range of equivalents" until the exact scope of an invention is determined and then the range of equivalents includes *any and all forms* in which the invention can be expressed. As said in *Detroit Copper Mining Co. vs. Mine & Smelter Co.*, 215 Fed., 103:

"When the whole *substance* of the invention may be copied in a *different form*, it is the duty of courts and juries to look through the *form* for the *substance* of the invention."

As said by this Court in *Bates vs. Coe*, 98 U. S., 31:

"In determining about similarities and differences, courts of justice are not governed merely by the names of things; but they look at the machines and their devices in the light of what they do or what office or function they perform, and how they perform it, and find that a thing is substantially the same as another, if it performs substantially the same function or office in substantially the same way to obtain substantially the same result; and that devices are substantially different when they perform different duties in a substantially different way, or produce substantially a different result."

## DISCUSSION OF DECISION IN VAN NESS CASE

Admittedly, defendants' infringing structure is, like Layne's, a deep-well pump mechanism adapted to be assembled, *unit by unit*, at the mouth of the well-bore and lowered, *unit by unit*, into the well-bore and, when completely assembled and lowered, to hang *pendent* from the surface, like a plumb-bob, said mechanism consisting of, in combination,

- (1) a *pump impeller* attached to a
- (2) *sectional line or power shaft* extending to the top of the well;
- (3) a *pump casing* enclosing the pump impeller;
- (4) a *water discharge sectional casing* extending from the pump casing to the top of the well; and
- (5) a *sectional shaft enclosing casing* extending from the pump to the top of the well.

Defendants contend, however, that such shaft-enclosing casing does not perform the three functions performed by Layne's shaft-enclosing casing, to-wit:

- (a) *alinement* of shaft
- (b) *protection* of shaft bearings
- (c) *conduit* for lubricant.

We shall now discuss the Van Ness decision in respect to the three functions respectively performed by Layne's shaft-enclosing casing and by the shaft-enclosing casing in the Van Ness structure.



## VAN NESS CASE, 213 FED., 804

In order that your Honors may know precisely what pump structure was held to infringe in this *Van Ness* case, we reproduce on the opposite page a drawing of the Van Ness pump. The original cut, of which this drawing is a reproduction, appears opposite page 73 of the brief filed in the Court of Appeals by the appellant, Marvin B. Van Ness. The opinion of the Court of Appeals, in the *Van Ness* case, shows this drawing was accepted as correctly disclosing the Van Ness pump.

By reference to this drawing, it will be seen the Van Ness pump embraced a structure hung pendent from the top of the well and including a *sectional shaft* enclosed in a *sectional casing* provided with *intermediate shaft bearings* and said casing being surrounded by the water-discharge casing communicating with the discharge outlet of the pump casing. The lubricant is fed to a point above the first shaft bearing and circulates or passes, *by gravity*, between such bearing and the shaft, between each successive bearing, within the shaft-enclosing casing and the shaft, and finally between the *long sleeve bearing* and shaft into the pump casing, thus lubricating all said bearings, in series.

It will be noted that the lower *thrust bearing does not bear on its seat* and, therefore, offers no *mechanical obstruction* to the passage of the lubricant down between the *long sleeve bearing* and the shaft. Con-

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versely, said *thrust* bearing offers *no mechanical obstruction* to the passage of water up between the long sleeve bearing and shaft and then out into the shaft-enclosing casing. Of course, the "long sleeve bearing," itself, offers a mechanical obstruction to the flow of water and detritus upward between it and the shaft. This "*long sleeve bearing*" plus "*the down pressure and down flow of lubricant*" prevent the water being pumped and the detritus carried thereby from passing upward between the long sleeve bearing and shaft and thus coming into contact with and destroying the *intermediate* bearings located within the shaft-enclosing casing.

The Court of Appeals held this Van Ness pump infringed because it embodied the *substance* of Layne's idea of means and embraced a shaft-enclosing casing performing the three functions of (a) *protection*, (b) *conduit for lubricant*, and (c) *alinement*.

(a) *Protection in Van Ness pump*: Regarding the protection afforded by the shaft-enclosing casing against the destructive action of the detritus carried by the water being pumped, the Court said:

"The defendant denies that his pump-shaft casing performs any one of the three functions attributed to that of the patent in suit. He denies that it is a closed casing in any true sense. *It seems not to be closed so far as concerns the entrance of air.* However, the proper interpretation of the words 'closed casing' is a closure *only against what is necessary to be excluded for the successful operation of the invention*, and that, in this case, as we under-

stand it, *is water and sand*, because when not excluded the first corrodes and the second wears the shaft and its bearings. It seems also true that the closure against water *is only partial*, since the *lower bearing* of defendant's apparatus is not within the enclosing casing, *though the intermediate and top bearings are*. So it seems doubtful whether the defendant's pump casing keeps the water from the shaft and bearings *when it is not in operation*, and the argument is that in the rice country, where it is principally used, it remains out of service nine months of the year. For these reasons, it is argued that the defendant's casing is not a closed one, even against water and sand. However, the record shows that protection against water and sand is afforded by defendant's casing to all *but one* of the bearings and to the shaft in the same degree as by that of the patented casing, *at least during the period of the pump's operation*, and that the protection afforded by defendant's casing is different *only in degree* from that afforded by the patented casing."

#### INFRINGEMENT IS NOT AVOIDED BY IMPAIRMENT OF THE FUNCTIONS OF AN ELEMENT IN DEGREE

It will be noted the Court held it *immaterial* that the Van Ness shaft-enclosing casing did not afford as *complete* protection as did the Layne casing. This finding is in accord with numerous decisions to the effect that "*Infringement is not avoided by impairment of the functions of an element of a patented device in degree . . .*" *Kawneer Mfg. Co. vs. Detroit Show Case Co.*, 240 Fed., 739. As said by Chief Justice (then Judge) Taft in the case of *King Ax Co. et*

*al. vs. Hubbard*, 97 Fed., 795, 803, Judges Lurton and Severens concurring:

"This is an instance, not infrequent in patent litigation, where the infringer has sought to evade the claim of a patent, the *substance* of which he is appropriating, by deliberately *impairing the function* of one element, without destroying the *substantial identity* of structure, operation, and result. *Sewall vs. Jones*, 91 U. S., 171; *Coupe vs. Weatherhead*, 16 Fed., 673; *Machine Co. vs. Binney*, 24 Fed. Cas., 653."

In *Sewall vs. Jones*, 91 U. S., 171, this Court said:

"To constitute an infringement, the thing used by the defendant must be such as substantially to embody the patentee's mode of operation, and thereby to attain the *same kind of result* as was reached by his invention. It is not necessary that the defendant should employ the plaintiff's invention to *as good advantage as he employed it*, or that the result should be the *same in degree*; but it must be the *same in kind*."

In *Manton-Ganlin Co. vs. Dairy Machinery Co.*, 238 Fed., 210, 215, it is said:

"The *impairment of the function of a part* of a patented structure by *omitting a portion* will not avoid infringement, nor will a mere change in form, when the principle of operation is preserved and appropriated."

It is to be noted, however, that it is *when the pump is in operation* that the bearings need *protection* from

the destructive action of the sand and detritus carried *by the water being pumped.*

When the pump is idle, the water in the well is in a relatively quiescent state and, therefore, the sand and detritus therein *settle* so that any water, which might get into the shaft casing during such periods of idleness, would not carry such destructive detritus. Furthermore, the sand and detritus will wear and cut out the bearings and shaft *only* when the shaft is *rotating* during the pump's operation. When the shaft is *not* rotating and the water is practically quiescent, there could be no wearing or destructive action by the detritus. Furthermore, the lubricant adhering to the shaft and bearings after cessation of operations, would sufficiently protect same from corrosion by any water that might slowly seep into the casing during non-operating periods.

It is, for the foregoing reasons, that the Court of Appeals, in the *Van Ness* case, held the Van Ness pump embodied the *substance* of Layne's *protective feature because, when operating, the Van Ness shaft-enclosing casing, in co-operation with the downflow of lubricant therein, effectually excluded the water being pumped and the detritus carried thereby.* In other words, as said, in substance, by this Court, in *Sewall vs. Jones, supra*, to constitute infringement it was not necessary for Van Ness to employ Layne's invention to *as good advantage as Layne employed it* or that the result should be the same *in degree.*

Furthermore, if Van Ness had seen fit so to do, he could have continued the feeding of the lubricant during the pump's idle periods, in which event, the down-flow of lubricant in co-operation with the shaft casing would have continued to exclude all water and detritus precisely as during operating periods. Layne's means were present for accomplishing such a result.

Continuing its discussion of the Van Ness closure, the Court of Appeals said:

"The closure in the *patented* casing is effected by stuffing boxes *as well as by the presence and downward pressure of the oil between the bearings and the shaft*, which serve to keep the water from pressing upward into the shaft casing between the bearings and the shaft. *The closure in defendant's casing is effected by the last method only*, and without the use of packing or stuffing boxes. Each casing serves to effect at least a partial closure against the water and sand. The difference is one of method and *degree* only, and for that reason it seems that the defendant's casing infringes this element of the patent, at least to some extent."

The foregoing *finding of fact* fully confirms the correctness of Mr. Layne's testimony herein (R., 606) to the effect that, in the Layne patented structure, the water and sand are excluded from the shaft-enclosing casing by

1. Mechanical means "*helped*" by the co-operation of the
2. Downward flow and pressure of the lubricant.

It will be noted, the Court of Appeals found that, in the Van Ness structure, the water and sand were excluded,

2. "By the last method only," to wit: *The downward flow and pressure of the lubricant.*

However, we believe the Court simply meant, by so finding, that the Van Ness structure did not embrace packing or stuffing-boxes, but did embrace, *as is obvious, the long-sleeve bearing*, in co-operation with which *mechanical means*, the downward pressure of the lubricant could exclude the water and sand.

As we shall hereafter demonstrate, the structure, of the defendants' herein, embraces not only the same *long-sleeve bearing* and the downward pressure of the lubricant found in the Van Ness structure, *but additional mechanical means* constituting a packing and stuffing-box and also other mechanical means for making the *long-sleeve bearing* more effective in its operation as the full equivalent of the Layne stuffing-box.

(Note: In the *Van Ness* case, the defendant produced proofs showing that the lower *thrust bearing* rested on its seat on the brass bushing *only* during the *installation* of the pump. The shaft was then raised and adjusted so such contact between this bearing and the brass bushing was eliminated. The testimony on this point is quoted on page 74 of the Van Ness Brief and reads as follows:

"A. The lower thrust bearing as shown on that drawing [reproduced opposite page 78 of this



Brief] does not operate when the pump is in operation. It is put on that pump solely for the means of acting as a stop and when the pump is ready for operation this lower thrust or stop-bearing is raised from the bushing and the thrust is placed on the ball thrust bearings at the top of the pump and being placed there by the top adjusting nut, as shown. The thrust is transmitted through the pully through this thrust bearing."

The foregoing shows this thrust bearing *in no way aided* the downward pressure of the lubricant in excluding the water and sand. That the Court accepted this proof as *correctly disclosing the operation* of the Van Ness pump, is clearly indicated by its finding that "The closure in defendant's casing is effected by the *last method* only, and without the use of packing or stuffing-boxes." The "last method" was described, by the Court, as "*the presence and downward pressure of the oil between the bearings and the shaft, which serves to keep the water from pressing upward into the shaft casing between the bearings and the shaft.*"

(b) *Lubrication in Van Ness Pump*: Regarding the lubrication employed in this pump structure, the Court of Appeals said:

"The second function of the *patented* casing is that of providing lubrication for the bearings. In *both casings*, that of defendant *as well as that of complainant*, the oil is put in the apparatus *at the top and passes through the bearings from the top through the intermediate to the lower bearing*, being retained for a time above each bearing and serving in this way not only to lubricate each bear-

ing, *but also to help close the shaft casing against the ingress of water and detritus.* The defendant's casing and that of the patent in suit perform this function to substantially the same extent, though the respective bearings as to the means for the flow of the oil through them are somewhat differently constructed."

It is obvious, said downward flow and pressure of the lubricant in Layne's patented casing could not "*help close the shaft casing against the ingress of water and detritus*" unless such lubricant was able to enter and pass down between the shaft and the lowest shaft bearing and between the shaft and stuffing in box 40, at which points the water and detritus would tend to enter the said shaft-enclosing casing. If the lubricant passed between the shaft and such bearing and stuffing, it would then enter the pump casing containing the pump impeller, precisely as Mr. Layne testified herein.

We shall hereafter demonstrate that the defendants' pump structure not only employs precisely the aforesaid so-called "circulatory" system, but it also employs the so-called "stagnant" system of lubrication, in which the heavy grease remains within the shaft-enclosing casing *for years* after being applied by the defendants herein.

It is to be noted that the shaft-enclosing casing, so far as lubrication is concerned, merely functions as *a conduit for the lubricant.* In the respective structures of Layne, Van Ness and defendants herein, the lubricant is fed into the top of the shaft casing which

merely acts or functions as a *conduit* down which the lubricant flows.

After the lubricant has passed down, in such conduit or shaft casing, through each of the bearings therein, *it has completed its lubricating function*. It is quite immaterial what then becomes of it. In such lubrication of the bearings, the shaft casing functions merely as a *conduit* and, therefore, such "*conduit function*" is completely performed by it in respect to any lubricant that has passed through all of the bearings. It is, therefore, quite *immaterial*, so far as concerns the performance of such conduit function, what becomes of the lubricant after it so passes through the casing.

*Nevertheless, the main ground of defense herein is the contention that infringement is avoided if the lubricant escapes from the bottom of defendants' shaft casing after it has passed through such casing and conduit and thus completed its lubricating function.*

In the first place, the lubricant passes through Layne's shaft casing and from the bottom thereof through the stuffing-box into the pump casing, just as the proofs show and just as the Court of Appeals, in the *Van Ness* case, held and just as Judge Dietrich herein found to be the fact.

In the second place, if such were not the case, nevertheless infringement would not be avoided by any such immaterial variation in respect to an immaterial feature. Layne's patent is not on a process of lubrication but covers a structure, in which one element operates as a *conduit for lubricant*. What be-

comes of the lubricant after passing through such conduit is immaterial. There is no pretense to the contrary.

The broad and *revolutionary* Layne invention does not depend, in respect to novelty, patentability, mode of operation and results accomplished, upon any such practically immaterial and minor characteristic *as the ultimate disposition* of the lubricant after it has performed its *two-fold function* of lubricating the bearings and helping to exclude the water being pumped and the detritus carried thereby.

In the *Getty vs. Layne* case, the Court of Appeals found, *as a fact*, that

"The Layne patent . . . did accomplish a *revolution* in the well-drilling industry."

Certainly this *revolutionary* invention, to use the words of Judge Gilbert in *Parker vs. Stebler*, 177 Fed., 210, "*marked a distinct step in advance, whereby a notable success was achieved.*"

It can properly be designated as a "*pioneer improvement*" which stands *at the head* of a *new class* in this art. Being of such a *generic* character, the *generic* claims in suit should be accorded a liberal construction and held to cover every *species* within the *genus*, just as Judge Hawley said in *Los Angeles Art Organ Co. vs. Aeolian Co.*, 143 Fed., 880, 884: "This (generic claim) included the numberless *species* in which the skilled mechanic or future inventor might embody their creation."

The attitude of the courts, towards such meritorious inventions, is thus expressed by Chief Justice (then Judge) Taft, speaking for the Court of Appeals for the Sixth Circuit in the case of *King Ax Co. vs. Hubbard*, *supra*:

"This Court, following the Supreme Court, has pointed out in a number of cases that, the more meritorious the patent, the more liberal will the Court be in applying the doctrine of equivalents *to cover devices adopted for the purpose of appropriating all that is good* in a patent without rendering the tribute which the patent law was intended to secure, for a temporary period, to those who by their ingenuity have made possible *real progress in the industrial arts.*"

(c) *Alinement of Bearings in Van Ness Pump*:

Regarding this feature, the Court of Appeals said:

"The third function performed by the shaft casing of the patent in suit is that of *aligning the bearings and the pump shaft* so as to keep the latter in a vertical position in the well. In the absence of intermediate support, the tendency of the shaft, if suspended only from the top, would be to swing laterally in the well, and so get out of alignment. This is corrected by taking advantage of the downward pressure of the shaft due to gravity, in connection with the intermediate bearings through which the shaft passes."

The Court found this feature present in the Van Ness pump which is, like Layne's, a structure *suspended* from the top of the ground—a *pendent* structure *not supported on the bottom of the well as was*

*the Getty pump.* As said by the Court in the *Getty* case:

"It is also true that the Getty pump cannot be held to infringe the means that Layne used to keep his shaft properly aligned, since that was accomplished by *suspending* the mechanism from the top of the well, while Getty's pump mechanism receives its support *by resting on the bottom of the well.*"

In such regard, the Getty pump departed from the Layne invention in respect to one of its dominating and fundamental features. The great value of the Layne invention resides, in part, in the very fact that the structure, *concretely expressed in said invention*, can be assembled, *unit by unit*, on the top of the ground and lowered, *unit by unit*, into the well, so that finally the whole structure is assembled and installed *suspended* from the top of the well like plumb-bob, all without the necessity of man entering the well.

It will be noted that the Van Ness pump structure did not embody the subsidiary features and adjuncts disclosed in the Layne patent, such as the wedges, slip-joints, cleaning means, packing-compression means, etc., referred to in defendants' brief herein. These features and *adjuncts* are covered by specific claims not involved in either the *Van Ness* case or in the instant case and were not essential to the commercial success of the Layne invention. The *essence*, the *substance* of Layne's broad idea of means, is covered by the claims in suit.

The very fact that such *subsidiary features* were not

embodied in Layne's commercial structure and have been appropriated by the various infringers of patent in suit, demonstrates that the great commercial success of the Layne apparatus must be attributed *alone* to the features covered by the *broad* *claims* sued on herein.

#### INFRINGEMENT

THE MAJORITY OPINION OF A CIRCUIT COURT OF APPEALS REVERSES THE FINDINGS OF FACT OF THE TRIAL COURT BOTH AS TO (A) THE CONSTRUCTION AND (B) THE MODE OF OPERATION OF THE DEFENDANTS' APPARATUS.

In his opinion, Judge Dietrich states: (R., 892, 893.)

"I do not attempt minutely to describe the defendants' structure. *Long before they entered upon its manufacture they were intimately familiar with the plaintiff's mechanism both from the patent itself and from actual installations in the field.* While in the unassembled parts there are many minor differences of construction, in the assembled structures I find no substantial distinction. Both accomplish the same result by substantially the same means, operating in substantially the same way. The defendants' structure is sectional, and is installed and removed from the well in the same manner as that of the plaintiff. There is a close correspondence between the shaft sections, shaft casing sections and water conduit sections. The fact that in the defendants' mechanism the shaft bearing is an integral part of the combination coupling for both the shaft casing and the water conduit sections, and that no part of the pendent

weight is carried by the shaft casing, while in the plaintiff's structure the bearings are built into the shaft casing alone or its coupling, is unimportant. In either case, when the members are assembled they constitute indispensable and integral parts of a single mechanism, and the two assembled mechanisms are strikingly similar in both form and function. In the Halstead patent (No. 1,228,770—June 5, 1917), under which the defendants profess to act, *open joints in the shaft casing are specified, for the purpose, it is said, of admitting small quantities of water therein*, the contention being that by using as a lubricant emulsifying oil, which will mingle with the water thus admitted, the cost of lubrication may be materially reduced. The practicality of the idea may be doubted, but it need not be discussed. *While in the earlier stages of the trial defendants vigorously resisted the plaintiff's contention that in the structure they actually installed in the field the shaft casings were made water-tight, the position was virtually abandoned before the close of the hearing; but, however that may be, the plaintiff's contention is thought to be supported by the overwhelming weight of the evidence. At the outset the defendants may have undertaken to follow the teaching of the Halstead patent, but at the time the suit was commenced they were using great care so to construct and assemble the sections and their connecting parts that when assembled a perfect union was made between the casing and coupling, to the complete exclusion of water; and as added safeguards, the joints were sealed with white lead, and for a considerable distance the space between the driving shaft and the walls of the casing was packed with hard grease."*

(It is to be noted in this connection that in the concluding day of the trial, when plaintiff's expert,



W. A. Doble, Sr., was upon the stand in rebuttal, and the facts were being brought out with respect to the defendants' contention that they were using the device of the Halstead patent, with the loose joints in the shaft-protecting casing for the purpose of admitting water and using water lubrication, defendants' counsel made an objection, and, in order to avoid the testimony of such expert witnesses, stipulated that the joints of the shaft-enclosing casing of defendants' apparatus were tight and that defendants did not use the water lubrication of the Halstead patent. We refer particularly to R., 848-49, as follows:

"MR. LYON—Q. What effect or function has such white lead in that connection?

A. White lead, in that connection, performs the function of a packing to make a tight joint.

Q. To what extent is white lead used for that purpose in the mechanical art?

A. In the mechanical art it is used very extensively. I have used it myself for over forty years.

Q. Can you produce any standard text-books upon the question to show that it is so used?

MR. TOWNSEND—There is no controversy, your Honor, that white lead will perform that function under various conditions. Perhaps it performs that function here. It apparently does in some of the pumps. It is immaterial.

THE COURT—If you admit it performs the function here, I will sustain the objection.

MR. TOWNSEND—I do not see how we could controvert the fact that that would perform the function of making a tighter joint than it would if it was not put in there. But to say it makes an absolutely tight joint from top to bottom of the well, we do not think so, our tests show

that it does not. But it makes a tighter joint than it does if you do not put it in. I will admit that. It is a mere matter of degree as to how much tighter it gets.

THE COURT—Mr. Townsend, I understood your witnesses impliedly to deny that it had that function; that they put it in for the purpose, merely, of preventing corrosion or rust of the two parts.

MR. TOWNSEND—I believe it was put in, primarily, for the purpose of preventing rust.

THE COURT—I shall permit him to testify unless you admit it does perform that function, that is, that it performs the function of sealing the joints.

MR. TOWNSEND—I see no objection to agreeing to that stipulation as an additional function in the matter of preventing corrosion.”)

In the majority opinion of the Court of Appeals, it is stated:

“The defendants in their answer deny infringement of plaintiff’s patent, and allege that the well mechanism charged by the plaintiff as an infringement of the patent in this case was manufactured in accordance with and under the protection of letters patent No. 1,228,770, issued to Stanley M. Halstead, June 5, 1917.

\* \* \* \* \*

*“The evidence did, however, tend to prove that some water passed through the conduit or shaft casing at the tube joints to the interior shaft.*

(276 Fed. 472, 474.)

It is inconceivable why the majority of the Court of Appeals made this reference to such Halstead pat-

ent or to such erroneous statement of fact as to the mode of operation, unless such majority, to some degree and for some purpose, in their finding of non-infringement, relied thereon. It is to be noted in this connection, that the findings of fact of Judge Dietrich are approved and confirmed by Circuit Judge Gilbert in his dissenting opinion, wherein he says:

"I submit that the question of infringement in this case is not determinable upon the mechanism described in the Halstead patent. It is determinable upon the mechanism which was actually used by the appellants at the time of the institution of the suit. The Court below found, and it is so shown by the evidence, that while at the outset the appellants may have undertaken to follow the Halstead patent, they had abandoned it at the time when the suit was commenced, and were using great care so to construct their mechanism as to make a perfect union between casing and coupling with the complete exclusion of water; that the joints of their structure were sealed with white lead, and for a considerable distance the space between the driving shaft and the walls of the casing was packed with hard grease."

In this connection, the majority opinion of said Circuit Court of Appeals states:

"In *Ransome vs. Hyatt*, 69 Fed., 148, 16 C. C. A., 185, this Court held that the *issuance of a later patent was prima facie a presumption of a patentable difference between it and an earlier patent*, following the decisions of the Supreme Court in *Miller vs. Eagle Mfg. Co.*, 151 U. S., 186, 208,

14 Sup. Ct., 310, 38 L. Ed., 121; *Boyd vs. Janesville Hay Tool Co.*, 158 U. S., 260, 261, 15 Sup. Ct., 837, 39 L. Ed., 973. It is also a rule of law that infringement being denied, the burden of proof is upon the plaintiff to establish the charge. *Fuller vs. Yentzger*, 94 U. S., 299, 306, 24 L. Ed., 107; *Bates vs. Coe*, 98 U. S., 31, 49, 25 L. Ed. 68. We start, then, with a presumption in favor of the defendants' apparatus under the Halstead patent, and against the alleged infringement, and the burden of proof upon the plaintiff to establish infringement."

We submit that this proposition so advanced, is erroneous. It is based upon a fallacy. There is no presumption in law of non-infringement by reason of the fact that additional features in defendants' apparatus had been covered by a subsequent patent.

The fact that the defendants' structure, *in certain respects*, is covered by a subsequent patent, raises no presumption of non-infringement. Such subsequent patent may disclose a plaintiff's patented invention *plus* some addition thereto and, therefore, cover such invention *plus* the addition.

This has been so aptly expressed by the Circuit Court of Appeals for the Sixth Circuit, in *Herman vs. Youngstown Car Mfg. Co.*, 191 Fed., 579, at page 584, that a quotation therefrom places the matter entirely at rest. Said Court says:

"Defendant's device is manufactured under patent No. 765,406, issued July 19, 1904, to J. H. Wagenhorst, and the Court below gave to this fact some force in reaching his conclusion that the device did not infringe. We think that the granting

of the latter patent and defendant's conformity thereto are not of importance in this case on the infringement issue. There are expressions in some of the reported cases implying that by the later patent the government has granted a right to make and use the article so patented, and that such grant is inconsistent with any construction of the earlier patent which would forbid the manufacture of the later structure. *Such implication rests on a fundamental error.* A patent is not the grant of a right to make or use or sell. It does not, directly or indirectly, imply any such right. It grants only the right to exclude others. The supposition that a right to make is created by the patent grant is obviously inconsistent with the established distinctions between generic and specific patents, and with the well-known fact that a very considerable portion of the patents granted are in a field covered by a former relatively generic or basic patent, are tributary to such earlier patent, and cannot be practiced unless by license thereunder.

"Another reason sometimes advanced for supposing that the structure of the second does not infringe the claim of the first patent is that the Patent Office has declared that a patentable difference exists. The premise is sound, but not the conclusion. *In examining the second application, the Patent Office has no concern with the scope of the claim of the first, and does not and must not pay any attention thereto. It is concerned only with the early disclosure by the specification and drawings. Patentable difference does not of itself tend to negative infringement. It may just as well be based upon infringement, plus improvement; and improvement may lie in addition, simplification, or variance.*"

Referring further to the defendants' apparatus, in his opinion Judge Dietrich states:

"By the defendants much importance is attached to a feature of their lowermost shaft bearing—the one corresponding to the bearing in the plaintiff's mechanism equipped with a stuffing-box. In the lower portion of this bearing an annular groove is cut in the babbitt, leading from which small vents or slots are provided extending through the hub to the outside. For this device it is claimed the lubricant in the casing will work downward until it reaches the groove, and the water on the outside will have a tendency to traverse the bearing in an upward direction until the groove is encountered, and there both the water and the lubricant, following the lines of least resistance, will discharge into the well through the ducts. Upon this theory it must be apparent that so much of the bearing as is below the groove will receive no lubricant at all, and being open to the sand carried in the water, will in time cut out and cease to function as a bearing. But if it be assumed that the contrivance is possessed of both novelty and utility and is patentable as an improvement, it still remains true that in utilizing it the defendants also appropriate the basic idea of the plaintiff's invention. It is not a case where the plaintiff's mechanism is a failure and the defendants have, by a slight invention or the invention of a small element, turned it into a success. Admittedly the plaintiff's mechanism is a success, and hence the most that could be said for the defendants' device is that it is an improvement.

"It is also earnestly insisted by defendants that the two systems are differentiated by the fact that their lubricating system is circulatory, while that of the plaintiff is static. In one or two of the decisions cited *supra* more importance is attached

to this consideration than under the evidence here I have been able to accord to it. *Under the facts disclosed, the distinction is more apparent than real. In both cases the oil is fed in at the top in substantially the same manner, and under the force of gravity traverses the entire length of the shaft casing, lubricating all of the bearings in its course. In the actual operation of the plaintiff's mechanism there is necessarily some escape of thin oil through the bottom bearing; for, as already explained, a perfect closure at this point cannot be maintained. Possibly a larger quantity will escape at the bottom of defendants' structure; but even there, it is to be borne in mind, the lubricant must traverse a bearing of considerable length before it reaches the groove, and to some extent its down-flow is resisted by the upward pressure of the water, which is only reduced and not wholly eliminated by the means described. Indeed, it is very probable that in both mechanisms a comparatively static condition is, under ordinary conditions maintained at the lower end of the casing, due to the counter-action or counter-resistance of the columns of oil and water, one against the other.* In the plaintiff's mechanism a contrivance is provided for drawing or forcing out of the casing the residuum of spent or impure lubricants; but it cannot be said that the groove and vents in defendants' structure perform such a function. If, as I have been constrained to find, in the defendants' actual installations, the shaft casing is made impervious to water and it is packed for a considerable distance above and below each bearing with a hard, immobile grease, the only possible function of which can be to prevent the ingress of water, to impede the progress of the lubricating oil, and itself to serve as a lubricant, it must be held that the term 'circulatory lubricating system' is a misnomer, and that the difference in that

*respect between the two systems is colorable only. But, were the contrary view to be taken, it would still remain true that the plaintiff's lubricating system is practical and efficient, and is a part of its combination invention, the fruits of which another may not rightfully appropriate by substituting for a single and successful feature other means for accomplishing the same result."*

These findings of fact, as we have heretofore shown, are the judgment of the trial Court upon the oral testimony of the witnesses adduced before it. It cannot be claimed that there is no evidence supporting such findings. *The very utmost that defendants could contend is that there is a conflict of evidence.* Under such circumstances, however, the findings of fact of the trial Court are unassailable. *Adamson vs. Gilliland*, 242 U. S., 350, 353.

The trial Court's findings of fact, however, have also the support of the Presiding Circuit Judge, as clearly set forth in his dissenting opinion in the Circuit Court of Appeals, as follows:

"In both the appellee's and appellants' mechanism the oil is introduced at the top in substantially the same manner, and by gravity it traverses the entire length of the shaft, thereby lubricating all the bearings. In both there is some escape of oil through the lowest bearing. *The contention that the two systems are differentiated in that the appellee's lubricating system is static, while that of the appellants' is circulatory, is not sustained by the proofs.* In the appellants' mechanism, the shaft casing being made impervious to water and packed with hard cup grease a distance above and below each bearing, the ingress of water



is prevented, and the movement of the lubricating oil is impeded, so that there is no substantial difference in the operation of the two lubricating systems. Both use a closed casing surrounding the pump shaft from the pump to the top of the well, the casing being sufficiently closed to allow the feeding of a lubricating fluid down through the same to the various bearing parts for the shaft therein. Both accomplish the same result by substantially the same means, operated in substantially the same way. The fact that the appellants' static lubricants are supplemented by the use of an emulsifying oil is unimportant. The fact that in the appellants' mechanism more oil escapes from the lowest bearing than in the appellee's is also unimportant. *The ultimate disposition of the lubricant after its office is fulfilled is immaterial.* These differences do not enable the appellants to appropriate the substance of the appellee's invention."

We submit that the decision of the majority of the Circuit Court of Appeals is thus reversing the findings of fact of Judge Dietrich as to (a) the construction, and (b) the mode of operation, of defendants' apparatus, is unwarranted in law, erroneous, contrary to the evidence, and led such majority to an erroneous conclusion. This error permeates the entire decision, reflected in the majority opinion, of the Circuit Court of Appeals.

## B. GENERAL DESCRIPTION OF DEFENDANTS' INFRINGING APPARATUS

For the convenience of the Court, we reproduce on the opposite page Figure 1 of the Halstead patent, under which defendants originally contended they manufactured the apparatus charged to infringe. As pointed out by Judge Dietrich, defendants departed from the teachings of this patent in respect to the *loose joints* in said patent provided between *shaft-enclosing casing sections*. In defendants' actual installations, found to be infringements, the joints between the shaft-enclosing casing sections 25 and the couplings 23, are made *water-tight*. We have shown that such fact was stipulated and conceded by plaintiff's counsel near the end of the trial. We have adverted to the fact that Judge Dietrich states such fact is "*supported by the overwhelming weight of the evidence*" (R., 893).

In a general way, however, and otherwise than as to the provision of loose and leaky joints between the ends of the shaft-enclosing casing and the coupling hubs 23, the Halstead patent drawing Figure 1 may be used as an illustration by which defendants' infringing apparatus may be readily understood.

In said Figure 1, the pump 5 is attached to the *sectional* shaft 7 which extends to the top of the well through the shaft-enclosing sectional casing 8, 8a, 23, in which are supported the shaft bearings 22; the shaft casing is surrounded by the water discharge *sectional* casing 9, 9a, 17a, which extends from the

S. M. HALSTEAD.  
PUMP MECHANISM.  
APPLICATION FILED DEC. 20, 1915.

Patented June 5, 1917.  
2 SHEETS—SHEET 1.

1,228,770.

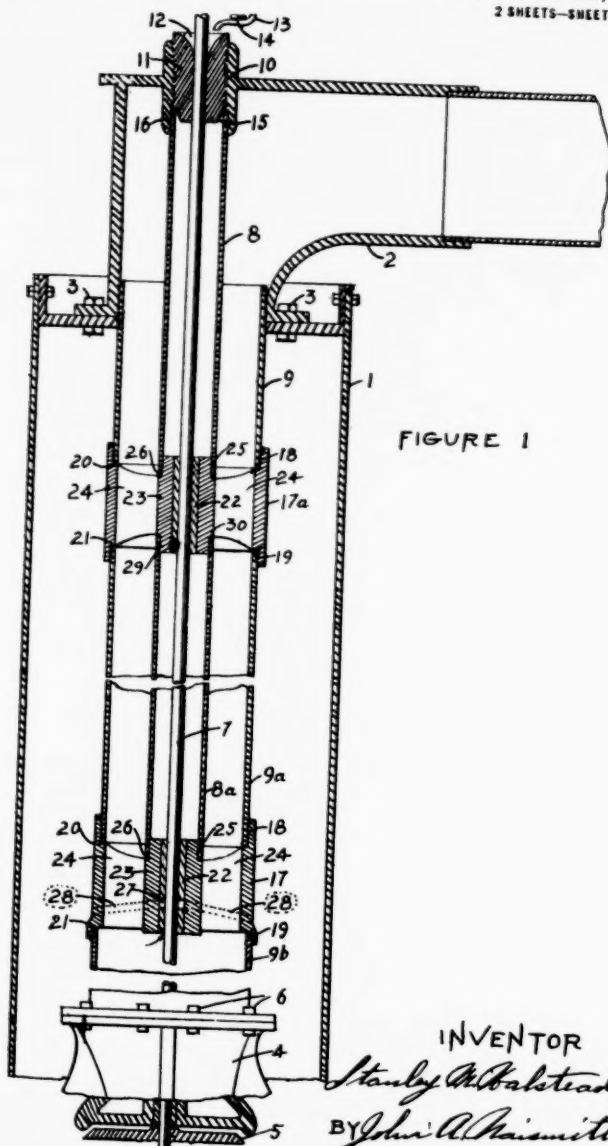


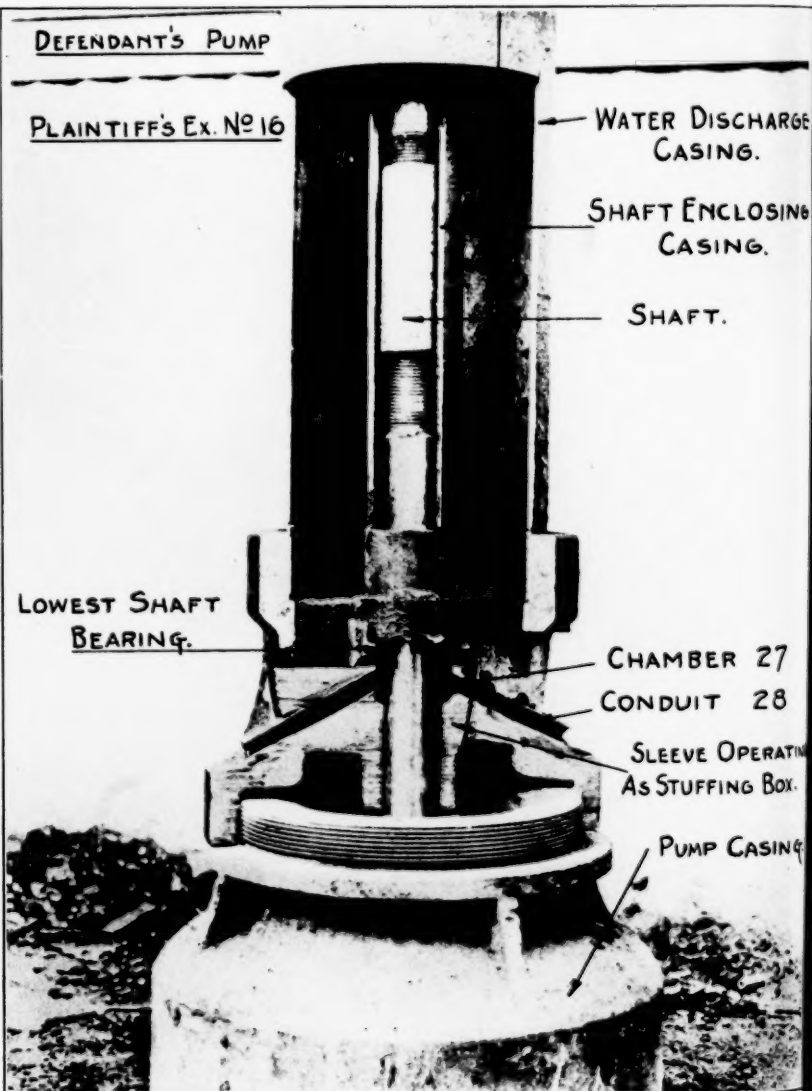
FIGURE 1

INVENTOR

*Stanley M. Halstead*  
BY *John A. Haismith*  
HIS ATTORNEY

DEFENDANT'S PUMP

PLAINTIFF'S Ex. No 16



WATER DISCHARGE  
CASING.

SHAFT ENCLOSING  
CASING.

SHAFT.

LOWEST SHAFT  
BEARING.

CHAMBER 27

CONDUIT 28

SLEEVE OPERATING  
AS STUFFING BOX.

PUMP CASING

pump casing to the top of the well; the shaft casing and water-discharge casings are *bound together* into an *integral structure* by the connecting pieces or webs 24 and the whole integral structure is supported at the top of the well and hangs *pendent* within the well casing 1.

Lubricant, with the exception of the hard grease packed in the shaft casing by defendants at the time of installing the structure, is fed into the top of the shaft-enclosing casing at 12 and passes or circulates down the casing through each intermediate bearing and through the lowest bearing into the chamber 27 from which it overflows and passes through the conduits 28 into the well. In defendants' pump (Anderson pump, Plaintiff's Exhibit 4), the shaft casing is provided with a stuffing-box at the top and through this air can enter the casing. This air-vent permits the gravity downflow of lubricant within the casing, as above described.

On the opposite page is reproduced "Plaintiff's Exhibit 16," a photograph of a portion of the pump structure sold by defendants to a Mr. Anderson. The pump structure itself is in evidence as "Plaintiff's Exhibit 4" (R., 571). As is apparent, portions of the water-discharge and shaft casings were cut out for the purpose of disclosing the interior construction of this pump structure. The data, appearing on the reproduction, was put there for the purpose of this Brief and does not appear on the exhibit photograph.

This Exhibit 16 discloses the *sectional* shaft passing

through the shaft-enclosing *sectional* casing which is surrounded by the water discharge *sectional* casing. The lowest shaft bearing, within the shaft casing, is shown and just below the same appears the annular chamber 27 from which extend the two conduits 28. In the Halstead patent, the shaft bearings are indicated as being provided with a babbitted portion 22. In defendants' pump structure, the lowest shaft bearing is a *long brass sleeve*, corresponding otherwise with the lowest shaft bearing as illustrated in the patent.

In Exhibit 16, this long brass sleeve is shown. The portion thereof, *above chamber 27*, operates as a "*bearing*" for the shaft. The portion of said sleeve, *below said chamber*, operates as a "*stuffing box*" to prevent the water being pumped and the detritus therein from passing from the pump up along the shaft into the shaft casing through the lowest bearing therein. In performing this function, it is aided by the conduits 28 which would tend to by-pass into the well any small amount of water and detritus which might force their way through the sleeve below such conduits.

The entrance of water and detritus into the shaft casing is, therefore, prevented by the long sleeve bearing at the bottom of the casing in co-operation with the pressure and downflow of the lubricant through such bearing and aided by the long sleeve operating as a stuffing-box to obstruct the upflow of the water and detritus from the pump.

As stated by Judges Dietrich and Gilbert, defend-

ants pack a large amount of hard grease within the shaft-enclosing casing and this remains in the casing for years and also assists in preventing the ingress of water and detritus into the casing.

During the normal operation of the pump, the level of the water in the well is below the conduits 28, so the only water, tending to enter the casing, would be the water being pumped; this would tend to enter same only through the lowest bearing within the casing by being forced up along the shaft from the pump. As stated before, the shaft casing, at all the joints therein, is water-tight so no water can enter same from the water-discharge casing.

In order to have definite and concise proof of the actual construction and mode of operation of the pumping apparatus manufactured and installed by defendants, plaintiff purchased from W. C. Anderson one of the pumping apparatus made and installed by defendants upon Mr. Anderson's ranch near Stockton, California. This pumping apparatus is in evidence, as Plaintiff's Exhibit 4. Exhibit 16, reproduced herein, is a photograph of a portion of such Exhibit 4 apparatus. Using said Exhibit 16 as a ready reference means for placing before your Honors the construction and interrelation of parts of Plaintiff's Exhibit 4, Defendants' Pumping Apparatus, and referring to the latter exhibit: if your Honors will refer to that section of the line or power transmitting shaft, illustrated in Exhibit 16, and extending from within the shaft-enclosing casing, through the lowest shaft bearing,

through the chamber 27 and through the sleeve operating as a stuffing-box, you will find in Exhibit 4 that that portion of this shaft which so extended through the bearing and within the casing, is *bright and smooth*, showing that it has not been subjected to wear or erosion by sand or detritus carried by the water stalled by them corresponds to Plaintiff's Exhibit 4, Anderson pump, is the pump offered in evidence by plaintiff as the exemplar of defendants' pumping apparatus. It was purchased for the purpose of an exhibit in this case. It is the only actual commercial pumping apparatus of defendants that has been introduced. The oral testimony shows that all of defendants' commercial pumping apparatus made and installed by them, corresponds to Plaintiff's Exhibit 4, except when defendants first started in their competitive business, when they attempted to use the apparatus as disclosed in the Halstead patent. The apparatus of the Halstead patent, with its water lubrication and the inlets of the water at the joints of the shaft-enclosing casing, was not a success, and was abandoned by defendants. However, that portion of this shaft section, which extended through the sleeve below chamber 27, was corroded, worn and pitted, clearly indicating the destructive action of the water and detritus which were forced into such sleeve from the pump. There could be no better proof of the efficient operation of such sleeve as a stuffing-box to effectually obstruct the passage of water and detritus



into the shaft casing through the lowest bearing therein. That no water and detritus had entered the shaft casing through such lowest bearing, was also proved by the condition of that portion of the shaft operating within such bearing and casing.

However, as the proofs show, one of these pumps will become inoperative within a few hours if the shaft and bearings are not effectively protected from the detritus in the water being pumped. Therefore, the successful operation of defendant's pumps is, by itself a demonstration that *the shaft-enclosing casing therein does afford such protection*, just as in the Layne apparatus.

Said shaft casing obviously *functions as a conduit* for the lubricant, which is fed into the top thereof and passes down through each bearing therein, thus lubricating all the bearings, in series.

Said shaft casing is also an *integral part* of the whole structure, which is supported at the top of the well and hangs therein pendent, like a plumb-bob. Being an *integral part* of such *pendent* structure, the casing itself is held *in alinement* and thus holds *in alinement* the shaft bearings supported therein, and thereby holds the shaft *in alinement*.

In said structure, the shaft, the shaft casing and the water discharge casing are made up of sections so that such structure may be assembled, *unit by unit*, at the mouth of the well-bore and, *unit by unit*, be

lowered into the well and therein hang pendent, like a plumb-bob. As said by Judge Dietrich:

"I do not attempt minutely to describe the defendants' structure. Long before they entered upon its manufacture they were intimately acquainted with the plaintiff's mechanism both from the patent itself and from actual installations in the field. While in the unassembled parts there are many minor differences of construction, in the assembled structures, I find no substantial distinction. Both accomplish the same result by substantially the same means, operating in substantially the same way. The defendants' structure is sectional, and is installed and removed from the well in the same manner as that of plaintiff. There is a close correspondence between the shaft sections, shaft casing sections and water conduit sections" (R., 892).

In other words, defendants' structure embodies the whole *substance* of Layne's generic invention covered by the three *generic* claims in suit.

On the opposite page is reproduced "Plaintiff's Exhibit 15," disclosing another view of defendants' structure. Mr. Layne also appears in the photograph.

#### C. DETAILED CONSIDERATION OF THE PROOFS IN RESPECT TO THE CONSTRUCTION AND MODE OF OPERATION OF DEFENDANTS' APPARATUS.

During the early stages of the trial in the lower Court, defendants' defense of *non-infringement* was principally based on the contention that, in defendants' structure, the shaft-enclosing casing or tubing

DEFENDANT'S PUMP.

PLAINTIFF'S EX. Nº 15.



Modern Well, San Jose, Cal.  
Taken Oct. 2, 1914. Photo by S. H. ...  
City of San Jose, Cal.



was *not* water-tight at the respective joints between the casing sections 8 and the tapered hubs 25 on the coupling-pieces 23, and, therefore, the casing did not protect the shaft bearings from the destructive action of the water being pumped and the detritus carried thereby.

The proofs so conclusively demonstrated such contention to be contrary to the facts, that defendants' counsel abandoned such contention. The proofs disclosed that each of said joints was *water-tight* and *sealed* by white lead. This was admitted by defendants' counsel.

"THE COURT—I shall permit him to testify unless you admit it (white lead) does perform that function—that is, that it performs the function of *sealing* the joints.

MR. TOWNSEND—I see no objection to agreeing to that stipulation as an additional function to the matter of preventing corrosion" (R., 849).

As said by Judge Dietrich in his opinion herein:

"While in the earlier stages of the trial defendants vigorously resisted the plaintiff's contention that in the structure they actually installed in the field the shaft casings were made water-tight, *the position was virtually abandoned* before the close of the hearing; but however that may be, the *plaintiff's contention* is thought to be supported by the *overwhelming weight* of the evidence. At the outset the defendants may have undertaken to follow the teaching of the Halstead patent, but at the time suit was commenced they were using great

care so to construct and assemble the sections and their connecting parts that when assembled *a perfect union was made between the casing and coupling, to the complete exclusion of water*; and as added safeguards, *the joints were sealed with white lead*, and for a considerable distance the space between the driving shaft and the walls of the casing was packed with *hard grease*" (R., 893).

In view of this "*finding of fact*" by the lower Court, little need be said on this question of defendants' shaft-enclosing casing affording complete and effective *protection* to the shaft and shaft bearings from the water being pumped and the detritus carried thereby. As, however, the majority opinion of the Circuit Court of Appeals has made much of this issue, abandoned by defendants in the lower Court in the face of such "*overwhelming*" proofs inconsistent therewith, let us consider briefly the proofs.

Referring again to Figure 1 of the Halstead patent, it will be noted that the end of each hub or coupling member 23 is shown reduced in diameter or, as said in the Halstead patent, provided with an annular rabbet 25, thus forming a seat 26. This annular rabbet or recessed portion of the hub is illustrated as *cylindrical* in form having *parallel* faces. The said recessed portion of the hub or casing-coupling receives the end of a section of the shaft-enclosing casing 8, and which end of the casing section slips over the hub and seats on the seat 26.

The evidence shows that, at first, defendants' used

hubs having *no taper*, such as disclosed in the Halstead patent. A tapered hub was then employed, the taper commencing about three-quarters of an inch from the seat. The hubs now used are tapered from the seat to the end of the hub. "Defendants' Exhibit C" was offered in evidence by defendants as an exemplar of their hub construction. Defendants' engineer, Conant, tested Exhibit C by using a gauge, corresponding to the interior diameter of the reamed out portion of the end of each tube section, and found same could be moved by hand without pressure only to a point *nine-sixteenths* of an inch from the hub-seat. To seat such tube section, it is obvious a great force must be applied to the tube *in order to expand its end sufficiently to pass over the enlarged portion of the hub*. Mr. Doble's testimony shows that, at the Selby ranch installation of defendants, the tube, in being forced on to the hub, was tapered, flared or made bell-shape at its end for a distance of seven-eighths of an inch from the tube end. He found the interior of the tube actually *polished* or *burnished* where it had been passed over the hub-taper and that there was a *surface* contact between the hub and tube for a distance of seven-eighths of an inch. Mr. Doble also found the white lead, used to seal the joint.

Regarding the character of joint formed by so expanding a shaft-casing section over such a tapered hub, the witness, W. A. Doble, Sr., testified:

"MR. LYON—With regard to the bell coupling joint that is made by the tapered hub and

the end of the tube, what have you to say as to that insuring a tight closure?

MR. TOWNSEND—They are referring to a flared end of a coupling that results from being pushed down onto the hub. We have told you how they are made, and I think there again that we are willing to stipulate that the more bearing surface you have between two parts, under certain conditions, you have a tighter joint.

MR. LYON—We want to prove by the witness that the pressure of this tube in the manner that has been testified to by himself and his son, by means of the screwing of the couplings together and the pressing of the tube onto this tapered hub, is one of the best known, tightest joints that are used in mechanics; that is the purpose of it; and we are following up the testimony of Wm. A. Doble, Jr., and the stipulated testimony of this witness to show that it is commonly used, in fact is used where the greatest pressures are to be expected; and I expect to show by this witness that if it is desired to take care of gasoline and other very light products, as well as very dry steam under high pressure, such bell-joints, as they are called, are used, and that they are known to give the tightest kind of a joint.

THE COURT—Unless there is an admission on the part of the defendant, I shall permit you to go into it.

A. I have very carefully observed the joints of these pumps that were withdrawn, and the tapered structure or construction of that hub, with a tube parallel and forced over the tapered hub will make the most perfect joint, using 'perfect' in a relative sense, that is known in mechanics. And in regular mechanics, on a diameter of approximately three inches, from two to three inches, to secure force-fits, which are put together under hydraulic stress, an expansion of from  $3/1000$  to



6/1000ths of an inch is allowed; and from the measurements on these hubs, I find that the tube is expanded to approximately 24/1000ths or 26/1000ths of an inch, and that forces the tube to conform to the tapered structure of the hub, and makes the most perfect closure against leakage that can be produced mechanically; and, due to that forcing action, the inner surface of the tube is burnished and brought down to a perfect surface, as shown by the tube removed; and throughout all the high-pressure work which I have done, we have used, for the highest pressure work, a tapered joint; it is the common practice of the American Society of Auto-Motive Engineers for all joints, as is shown clearly in the standard forms of the Society of Auto-Motive Engineers; and, furthermore, I have used it for steam pressures as high as 1500 pounds per square inch, with super-heated steam having a temperature of from 800 to 900, or 1000 degrees, so that the steam was a red-hot gas; but it is the only form of joint which we could develop that would make an absolutely tight joint under those circumstances. The amount of expansion which is allowed there in forcing that tube over the tapered hub, and in combination with the white lead, makes a perfect mechanical closure."

In view of the proofs, and the stipulation and admission of defendants' counsel, *there can be no doubt as to the defendants' shaft-enclosing casing being water-tight at all the joints between hub and tube sections, thereby affording complete protection to the shaft bearings from the detritus in the water being pumped.*

In said Figure 1 of the Halstead patent, 22 indicates the babbitted portion of the lowest hub 23. In de-

defendants' structure, a *long brass-sleeve bearing* is used in the place of such babbitted portion of the hub immediately above the pump.

In said Figure 1, the shaft is not shown as made up of sections, but in defendants' commercial structure a jointed shaft is used.

In view of the foregoing, it will be apparent that defendants' device, like the Van Ness and Layne, embraces a structure hung *pendent* from the top of the well and including a *sectional* shaft enclosed in a *sectional* shaft-enclosing casing provided with *intermediate* shaft bearings and said casing being surrounded by the water-discharge casing communicating with the discharge outlet of the pump casing. Furthermore, the pump, in each of said structures, can be suspended at any point in the well by reason of the structure being made up of joined units or sections and thus permitting the total length of the structure being varied by the addition or subtraction of such units.

(a) *Protection in Western Well Works Pump:*

Admittedly, the defendants' shaft-enclosing casing is water-tight at the respective joints between hub and tube sections. At those points, it is obviously a closure protecting the shaft bearings from the destructive action of the detritus carried by the water being pumped.

The proofs also show that the water being pumped and the detritus carried thereby are prevented from entering the bottom of the said casing.

As in the Layne and Van Ness structures, the water

and sand are prevented from entering the defendants' casing at that point by

1. Mechanical means, "helped" by the co-operation of the
2. Downward flow and pressure of the lubricant.

Before discussing the *mechanical* closure means, found in defendants' structure, we shall refer to the system of lubrication employed therein in respect to same *co-operating with the mechanical means in excluding the water and sand*.

According to defendants' engineer, Conant, lubricant is applied to defendants' structure, when being installed, as follows: Graphite grease is placed around the top of the bearing; on top of this, cup grease is placed and, when the tube is in place, oil is poured therein. On this point, the witness Folsom said regarding the application of the heavy grease:

"A. We usually only packed the grease around the shaft before we slipped the tube down; we used generally about thirty inches on a tube, all we could make stick on, adhere to the shaft, and then we slipped the tube over.

\* \* \* \* \*

THE COURT—What length of shaft?

A. I should say about 30 inches.

Q. At the top or bottom?

A. At the bottom of each section of the shaft.

Q. You mean 30 inches of each section?

A. Thirty inches of each section" (R., 629).

Defendants' witness Bradford also described the application of the graphite grease, the heavy No. 5 standard cup grease and then the oil (R., 711).

*So-called "Stagnant Lubrication"*: The proofs show that, years after the installation of one of defendants' structures, the *original* heavy grease, in large quantities, still remains within the shaft-enclosing casing. Certainly such system of lubrication can be aptly termed a "*stagnant*" one—if it be deemed material, at all, to find defendants' using in their apparatus, a "*stagnant*" method of lubrication.

Regarding defendants' *stagnant* lubrication, the defendants' engineer, Conant, testified:

"MR. WHITE—Q. Did you ever see a pump, after it was in operation for a couple of years, disassembled?

A. Yes.

Q. Did you ever notice at that time that this grease that was put in there *originally* still covered the tubes in large quantities, in each one of these tubular sections?

A. I have seen grease on the shaft, and I have seen grease in the tube.

Q. After two or three years' use of the pump?

A. Yes" (R., 697).

Plaintiff's witness Hall also testified regarding defendants' "*stagnant*" method of lubrication. In respect to the Anderson pump, forming the basis, in the proofs, of plaintiff's charge of infringement, Hall said:

"MR. LYON—Q. Now, on these pieces of shafting up here there seems to be something sticking. What is that?

A. It was heavy cup grease.

Q. And that was in this pump when you pulled it?

A. It was" (R., 633).

"Plaintiff's Exhibit 13" is a photograph of the shaft sections removed from the Anderson pump and discloses the large quantities of *cup grease* on the sections (R., 633).

In fact, the proofs of defendants' use of such a "*stagnant*" system of lubrication were so conclusive that defendants' counsel admitted the same. He said:

"MR. TOWNSEND—There is no doubting the evidence that has been given, or of the fact that some of that heavy grease is splashed around there, and some of it is going to stay in the tube and some of it on the shaft" (R., 793).

After *admitting the use of such "stagnant system"* of lubrication, counsel now base their non-infringement defense on the contention that such a "*stagnant system*" is not employed in defendants' apparatus!

The position of defendants' counsel on this point is the same as their anomalous position in regard to the joints between hub and tube sections.

After stipulating and admitting, at the trial, that said joints, in defendants' structure, were *tight* and *sealed* by the white lead, we find counsel devoting pages of their Brief to the contention that said joints are not *tight* and *sealed*!

We do not lose sight of the fact that, in connection with the operation of one of defendants' apparatus, the user thereof applies at the top of the casing, *drop by drop*, the so-called "*emulsifying*" oil. Of course, the fact that the "*stagnant lubricants* are supplemented by

the *addition* of the emulsifying oil is immaterial. The fact still remains that the "*stagnant lubrication*" is used by the defendants in their structures.

The so-called "*emulsifying*" oil is in fact nothing more or less than the Standard Oil Company's standard thread-cutting compound (R., 720).

As heretofore stated, it is our opinion that it is quite immaterial whether or not a "*stagnant*" method of lubrication is used. The Layne invention does not reside in any such immaterial feature.

However, if it be material, it is obvious and is admitted by defendants' counsel that such a use of "*stagnant*" lubricants is employed in defendants' apparatus.

Having described defendants' method of lubrication, we shall now show the manner in which defendants' shaft bearings are protected by *mechanical* means plus the *downward pressure of the lubricants*.

Defendants, as did Van Ness, employ a *long sleeve bearing* for the shaft. This is made of brass and corresponds to the lowest part marked 22 in said Figure 1 of the Halstead patent. The only point at which water and detritus could enter the shaft-enclosing casing would be between this long sleeve and the shaft. The proofs, and the condition of the shaft and bearings in the Anderson pump, show water and sand do not pass this sleeve bearing and enter the casing.

It is to be first noted that this long sleeve bearing is, in fact, divided into two parts; the *upper* part being above the annular chamber or channel 27, which com-

municates with the conduits 28 leading into the *well outside* the water-discharge casing; and the other or lower part of the bearing being below such chamber and conduits.

As a matter of fact, such *lower* part of the sleeve bearing cannot properly be designated as a *bearing*. It cannot be lubricated and is designed to protect the upper part of the bearing from the destructive action of the sand. It *obstructs* the upward flow of water and sand from the pump and reduces the same to a minimum. Therefore, when the water and sand, which are forced upwards between this lower portion of the sleeve and the shaft, reach the chamber 27, they will then flow along the line of least resistance, to-wit: through the conduits, *out into the well*, instead of upwards between the upper portion of the sleeve bearing and the shaft.

The upward *pressure* of the water being relieved and reduced by the water entering chamber 27 and there finding an outlet into the *well*, it is obvious that the upper part of the sleeve bearing can much more effectively, if not entirely, prevent the entrance of any water and sand between it and the shaft, and thus into the shaft-enclosing casing.

However, the upper portion of the sleeve bearing is assisted in excluding the water and sand *by the downward pressure of the heavy lubricants and oil within the casing*, so that no water and sand enter the casing or pass between the upper portion of the sleeve bear-

ing and the shaft. The condition of the Anderson pump shaft and bearings demonstrate the correctness of the foregoing.

As stated by Mr. Doble, Sr., and as is obvious from an inspection of the Anderson pump structure, the shaft therein, beginning at a point thereon where the shaft enters the *upper* part of the sleeve bearing, is *bright* and *smooth*, thus indicating it had not been subjected to the corroding action of water or the brading action of sand, and had been kept lubricated by the grease.

At that portion of the shaft where it passes through chamber 27 and the lower part of the brass sleeve, the same has been corroded and abraded by the water and sand.

The use of said *lower portion* of the brass sleeve as a mechanical or stuffing-box device to protect the upper and only portion of the brass sleeve, used as a *bearing*, is accurately described in the Halstead patent, commencing at line 53, page 2, where it is said:

"It will be observed that channel 27 is placed a short distance above the lower end of bearing 17. This is done so that the lubricating emulsion will traverse the greater portion of the bearing before draining away."

Defendant and patentee, Halstead, then goes on to describe his *mechanical* means, or *stuffing-box* arrangement, for protecting said bearing. He says:

"That portion of the bearing below channel 27



will not be lubricated because the upward pressure of the water being raised will tend to force a *small* amount of water in the direction of the arrow upward through the bearing until the channel 27 is reached, where it will be drained away through auxiliary conduits 28. There being no provision for filtering the water at this point, the bearing *below* channel 27 will of course be worn by attrition, *but the major portion of the bearing will remain true and properly perform its function.*"

However, defendants do not content themselves with alone using such *mechanical* means to prevent water and sand entering the shaft-enclosing casing. They use, in addition thereto, further *mechanical* means, which also operate just as a stuffing-box operates.

Each intermediate bearing is provided with a helical groove. The heavy grease above the bearing passes, by gravity, into the groove and is moved therethrough by reason of the *smooth* surface of the rotating shaft contacting with the outer surface of the grease resting in the groove. It is to be noted the grease is moved solely by the friction between the *smooth* surface of the shaft and the exposed surface of the grease. Obviously, heavy grease would be so moved only at a very slow rate.

Professor Lesley, defendants' witness, said the *pressure*, at which the oil would be moved, increased as the *viscosity increased* (R., 881). *He failed to make any measurements of the rapidity of flow* (R., 882).

The most significant things about the Professor's testimony are the experiments and tests he did *not*

make and the questions which were *not* asked him by defendants' counsel. We shall refer hereafter more at length to this phase of his testimony.

The point we now make is that the heavy greases would be moved downward with *pressure* by reason of such helical grooves. The only possible result of such action is the packing of the heavy grease in the bottom of defendants' shaft-enclosing casing and thereby forming a most effective stuffing-box or mechanical means for preventing the ingress of water and sand between the sleeve bearing and shaft.

It is thus seen that defendants' structure embraces the following *mechanical* means for excluding the water and sand from the bottom of the shaft-enclosing casing:

a. Long brass sleeve bearing. (Note: This corresponds to the *only* mechanical means used in Van Ness pump for preventing entrance of water and sand.)

b. Lower portion of brass sleeve *not* used as a *bearing* but as an *obstruction* to passage of water and sand. (Note: Mr. Layne says this acts merely as a stuffing-box) (R., 604).

c. Helical grooves operating to pack heavy grease in bottom of shaft-enclosing casing, thus constituting same a stuffing-box. The downward flow and pressure of the emulsifying oil also co-operates with these mechanical means in excluding the water and sand.

(b) *Lubrication in Western Well Works Pump:*

We have heretofore discussed the so-called "*stagnant*" system of lubrication employed in defendants' structure. The heavy "*stagnant*" lubricants, which remain in the structure for years, are supplemented by the drop by drop addition of the lighter so-called emulsifying oil. By the use of such lubricants the bearings are lubricated *in series* by the downward flow of the lubricants. The same "*series*" lubrication of the bearings is employed in the Layne patented structure.

As stated before, the ultimate disposition of the lubricant is immaterial.

The only feature of the Layne invention that is material, in respect to lubrication, is the use of the shaft-enclosing casing *as a means or conduit* for conveying the lubricant from bearing to bearing so that the bearings are lubricated in series.

Layne conceived the idea of employing a shaft-enclosing casing for the purpose of performing said function of conveying the lubricant, admitted at the top of the casing, from bearing to bearing.

The said casing also performs the other two functions of protecting the shaft bearings from the destructive action of the sand and of alinement. It is the presence of *such a casing* performing said functions that is material. *It is such a casing* that is an *element* of the respective combinations covered by the claims in suit and concretely expressing Mr. Layne's abstract "*idea of means*" or invention.

The said claims do not cover a *process* or *method* of lubrication but a combination of *mechanical elements* including said shaft-enclosing casing performing said three functions. It must be obvious, therefore, that it is quite immaterial what kind of lubricants pass through said casing or what finally becomes of the lubricants. If the casing is used to convey the lubricants from bearing to bearing, it is performing the only function attributed to it so far as concerns the feature of lubrication.

However, whatever view may be taken of this phase of the question of infringement, the defendants' apparatus infringes according to the precise contentions and line of argument indulged in by defendants' counsel. Admitting the correctness of the line of reasoning pursued by defendants' counsel, the facts do not support the attempted differentiation forming the basis for such line of reasoning.

According to the stipulations and admission of defendants' counsel, a "*stagnant*" method of lubrication is employed in defendants' apparatus, so the charge of infringement cannot be avoided on the ground of the absence of same.

(c) *Alinement in Western Well Works Pump:*

As said in the *Getty* case: "It is also true that the Getty pump cannot be held to infringe the means that Layne used to keep his shaft properly aligned, since that was accomplished by *suspending* the mechanism from the top of the well, while Getty's pump mech-

anism receives its support *by resting on the bottom of the well.*"

In the Western Well Works pump, the mechanism is suspended, like Layne and Van Ness—pendent from the top of the well.

Referring to Figure 1 of the Halstead patent, it will be seen the shaft-enclosing casing is made up of the tube sections 8, 8*a* and the tubular hubs or couplings 23. The lubricant passes through a tube-section, then through a tubular hub or coupling section into the next tube-section and so on down to the chamber 27, excepting, of course, the heavy stagnant lubricants which remain in the casing.

Each tubular hub or coupling section 23 is just as much a constituent part of the shaft-enclosing casing as are the tube sections 8, 8*a*. The tubular hub or coupling sections and the tube sections, when assembled, form an integral structure which serves as a continuous conduit for the lubricant. Eliminate one tubular hub or coupling section and the conduit is destroyed. Furthermore, each tubular hub or coupling section does its share in preventing the ingress of water and sand to the shaft bearings. Eliminate one tubular hub or coupling section and the "closure" is destroyed and the shaft bearings exposed to the direct destructive action of the sand.

Defendants' counsel and defendants' witnesses very conveniently ignore the foregoing facts and speak of the tube sections 8, 8*a*, as constituting the shaft-enclosing casing.

The tubular hub or coupling sections or parts of

such shaft-enclosing casing are *supported and suspended* directly from the top of the well and, in turn, they support and hold in position and alinement the shaft bearings and the tube sections 8, 8a. It is thus apparent that the shaft, in defendants' structure, is kept in alinement by the intermediate bearings which are supported by the shaft-enclosing casing which is suspended from the top of the well.

The fact that such shaft-enclosing casing parts 23 are supported and suspended from the top of the well by means which, in addition to performing such function, also serve as a water-discharge casing, is quite immaterial. The material thing is the suspension of the structure from the top of the well. In the Layne patented structure, the water-discharge casing or outlet 23 is also, in effect, made an *integral part* of the shaft-enclosing casing 20 by means of the block-and-strap arrangement 26. As said in the Layne patent, page 1, line 106: "As shown in Figure 2, the shaft casing 20, and the outlet pipe 23, are *bound together* by means of the block-and-strap arrangement 26. These connecting devices are distributed at intervals along the length of the shaft casing." Such "block-and-strap arrangements" correspond to the webs 24 in defendants' structure.

It is, therefore, apparent that both in the Layne structure and in the defendants' structure, the shaft-enclosing casing and the water-discharge casing are, in effect, *one integral structure* suspended from the top of the well. And in each the shaft is suspended from the top of the well and held in alinement by

bearings supported and held in position by the shaft-enclosing casing, which is also suspended from the top of the well. In this respect each differs from the Getty structure.

"Neither the joinder of two elements of a patented combination into one integral part, accomplishing the purpose of both, nor the separation of one integral part into two, which together accomplish substantially what was done by the single element, will avoid a charge of infringement."

*Pedersen vs. Dundon*, 220 Fed., 309, 311.

"The mechanical substitute 'may perform some other functions, but this does not prevent it from being an infringement.' *Norton vs. Can Co.*, 45 Fed. Rep., 638."

*Norton vs. Jensen*, 49 Fed., 859, 868.

In *American Can Co. vs. Hickmott Asparagus Canning Co.*, 142 Fed., 141, 146, Judge Gilbert said:

"Referring to this clamping device, the appellee's expert witness, Kruse, admitted that it was 'used for the purpose of wrapping the tin,' but said that its principal use was to assist in making the first hook. *The fact that it served an additional purpose is immaterial.* . . . It is the whole purpose of the doctrine of equivalency to protect the inventor against piracy and to secure to him the benefit of that which he has invented."

As said by Circuit Judge Nelson, as early as 1852, in the case of *Tatham vs. LeRoy et al.*, Fed. Cas. No. 13,760, 2 Blatch., 474:

"A *change in form* from the construction of an existing machine, is *not a substantial change* in the eye of the patent law; nor is a *change in proportions*. These changes require no great ingenuity, at all events they do not call for the exercise of the inventive faculties. They are simply the work of the inventive faculties. They are simply the work of a mechanic of ordinary skill, and, therefore, are entitled to no particular consideration when we are inquiring into the question of identity between the construction of two machines. *So, also, the substitution of a mechanical equivalent, as it is termed, in the construction of a machine, is not a substantial change.* There are many devices in construction that can be made by a skillful mechanic, differing very much from each other in appearance, but which, in the eye of the patent law, are regarded as identical. For instance, an inventor, in the construction of his machine, desires a given power, in order to give practical operation and effect to his discovery. One mechanic may furnish the power by means of a lever, another by means of a screw—two very different instruments—yet, so far as the use of the instruments and so far as their purpose to furnish the power is concerned, they are regarded simply as mechanical equivalents, and the use of one is one machine does not distinguish that machine from a machine in which the other is found. So, too, a given power may be obtained by a spring or by a weight, or by a pulley—apparently very different devices. Yet, as they are used for the same purpose, and to accomplish the same end in machinery, they are regarded as substantially identical. It is



also proper to state, in this connection, that a patentee is not confined to the precise arrangement, in the construction of his machine, which he has described in his patent. This is obvious from the principles already stated. *Formal changes are nothing—mere mechanical changes are nothing—all these may be made outside of the description to be found in the patent; and yet the machine, after it has been thus changed in its construction, is still the machine of the patentee, because it contains his invention, the fruits of his mind, and embodies the discovery which he has brought into existence and put into practical operation.*"

D. GETTY CASE, 262 Fed., 141.

In such case the Court found the Getty pump to differ from the Layne invention in respect to certain features. *As will hereafter appear, the Getty pump also differs from the defendants' pump in respect to the same features.* In other words, the Layne and Western Well Works pump structures are substantially identical, and each differs from the Getty structure in the same respects. Therefore, this Getty decision renders defendants herein no aid in escaping the charge of infringement.

(a) The difference between the Layne and Getty structures, first mentioned by the Court and particularly emphasized, is that the Getty structure is *not suspended* from the top of the well, but is supported *on the bottom of the well.*

The Court states that the El Campo pump (which

was held *not* to infringe) was also *supported on the bottom of the well*.

As above mentioned, one of the dominating features of the Layne invention is the arrangement thereof whereby the structure may be assembled, *unit by unit*, on the top of the ground and lowered, *unit by unit*, into the well and, at the desired position in the well, held *suspended* from the top of the well.

The Getty pump structure, being one *supported on the bottom of the well*, and thus differing from Layne's *suspended* structure in respect to a dominating feature, was held by the Court not to infringe the Layne patent.

However, the pump structure of defendants herein is suspended from the top of the well and is, therefore, in that respect substantially *identical* with Layne's structure and substantially *different* from the Getty structure, as well as from the El Campo structure.

(b) Another difference between the Layne and Getty structures, mentioned by the Court, is the *absence*, in Getty's structure, "*of physical obstruction*," at the bottom of the shaft-enclosing casing, to the entrance thereto of water and detritus.

As said by the Court: ". . . Getty's partial closure is effected by balancing the pressure of the column of water outside the shaft casing against the pressure of the oil inside the casing, *without the use of physical obstruction*."

We have heretofore discussed the "*physical obstructions*" or mechanical means found in the pump of

defendants herein and operating to prevent the entrance of water and detritus into the bottom of the shaft-enclosing casing.

In regard to the *efficient* operation of one of said "physical obstructions" in defendants' structure, defendant and patentee Halstead said in his patent, in respect to that portion of brass sleeve 22 below channel 27, and which does not operate as a bearing, as follows:

"That portion of the bearing below channel 27 will not be lubricated because the upward pressure of the water being raised will *tend* to force a *small* amount of water in the direction of the arrow upward through the bearing until the channel 27 is reached where it will be drained away through auxiliary conduits 28. There being no provision for filtering the water at this point, the bearing below channel 27 will, of course, be worn by attrition, but the *major* portion of the bearing *will remain true and properly perform its function.*"

It is thus seen that such physical obstruction, operating precisely *as the packing in a stuffing-box*, prevents the passage of water and sand to such an extent that only a *small* amount can possibly get by it and such *small* amount is so reduced in volume and pressure that it passes out into the well through the conduits 28. Thus the long-sleeve bearing, above the chamber 27, is an amply sufficient *physical obstruction* to prevent the water and sand passing between it and the shaft into the casing. Of course, the down-

ward pressure of the lubricant will co-operate with the sleeve bearing in excluding the water and sand, just as in the Layne apparatus, and as said by the Court, in the *Getty* case, where the Layne physical obstructions are described as effecting closure "*aided incidentally only by the pressure of the oil column.*"

An inspection of defendants' structure, as represented by the Anderson pump, Plaintiff's Exhibit No. 4, clearly shows that defendant and patentee Halstead was correct in stating that the long brass sleeve-bearing above channel 27 would be protected from the water and sand by reason of the obstruction to the passage thereof by the part of the brass sleeve below the channel 27.

No such physical obstruction was present in the *Getty* structure and, as a consequence, the lubricant flowed freely out of the casing and the water and sand could enter freely so far as physical obstruction was concerned. Mr. Getty's testimony on this point is quoted in the supplemental brief filed in the Court of Appeals on his behalf. At page 7 of such brief, his testimony is quoted as follows:

"I fully realized that in a pump construction such as mine, when the lubricant was permitted freedom of travel downward and out at the bottom of the shaft-casing, that the water of the well would be equally free to enter the shaft-casing from below, and the said water would frequently carry with it fine, sharp, cutting sand up through the bottom bearing, and that said bearing particularly, *and perhaps some of the bearings above*, would suffer from the cutting and

grinding action of the sand. All this was fully anticipated while the pump was being planned, *but as I saw no remedy, I decided that such destructive action must be tolerated.*"

Mr. Getty evidently meant he saw *no remedy other* than by appropriating Mr. Layne's invention and, therefore, decided to endure the destructive action of the sand and water.

On page 9 of such Getty Brief, the testimony of one G. E. Tarbox is quoted as follows:

"Q. 16. When you pulled this pump (Getty), what, if anything, did you find in the casing?"

A. Nothing, excepting a very small quantity of water and sand.

Q. About how much sand?

A. About a handful.

Q. And whereabouts in the casing did you find this sand?

A. Immediately around the top of the bottom bearing.

Q. How long had this pump been in operation before you pulled it?

A. Why, the pump, as near as I can tell, was installed some time in February, 1914, and was pulled, I think it was, Sunday, June 30, 1915."

A very different situation is presented by the Anderson pump, "Plaintiff's Exhibit 4," one of defendants' structures. An inspection thereof shows no water or sand have entered the casing; the bearings and shaft are bright and smooth and, when pulled and as it now remains, the shaft is covered with quantities of heavy grease.

Obviously, there could be no free flow of lubri-

cant through defendants' shaft-enclosing casing and no free flow of lubricant through defendants' shaft-enclosing casing and no free flow of water and sand into such casing. The proofs demonstrate the contrary. The heavy, stagnant lubricants which remain, for years, in the casing and on the shaft and above the bearings, would prevent even a free flow of the lighter emulsifying oil and certainly there is no free flow of such stagnant lubricants.

The condition of the Anderson pump demonstrates that the "*physical obstructions*," aided by the lubricants, have excluded the water and sand. There is, therefore, a substantial *difference* between defendants' structure and Getty's in respect to *closure*. On the other hand, there is a substantial *identity* between defendants' structure and Layne's in respect to *closure*.

(c) The third difference between the Layne and Getty structures, mentioned by the Court, was the continuous and free flow of oil through the Getty casing and out of the bottom thereof. The complete freedom of such flow is shown by the testimony of the witness, Tarbox, above quoted. On pulling a Getty pump, after a year and a half use thereof, he found only a little water and sand in the casing. *He found nothing else.* No lubricant remained.

The proofs show and defendants' witnesses and counsel admit that, *after years of use*, quantities of the original heavy grease, applied at the time of installation, remain in defendants' shaft-enclosing casing and on the shaft and above the bearings and, as Mr. Doble testified, in the spiral grooves in the bearings. On

this point, Mr. Doble, Jr., said of defendants' Selby ranch installation:

"MR. WHITE—Q. Did you examine one of these spiral bearings, or grooves in the bearings?

A. I did.

Q. What did you find with regard to its condition?

A. It was filled with grease."

With said heavy grease in the casing, on the shaft and in the spiral grooves of the bearings and *thus being found after years of use*, it is obvious that even the lighter, emulsifying oil could not flow freely through defendants' shaft-enclosing casing.

As stated before, Layne's patent claims respectively cover combinations of *mechanical* elements. One of said elements is the shaft-enclosing casing, which is used as a *closure* against the destructive action of the detritus in the water being pumped; also, as a *means* of supporting and holding in *alinement*, the shaft bearings and shaft and also as a *conduit* through which lubricant may be applied to the bearings in series. In our opinion, it is *quite immaterial* whether or not the lubricant flows freely or otherwise. The claims do not cover a *method or process* of lubricating, but merely a combination of mechanical elements of which one serves as a *conduit* for lubricants as well as performing other functions in respect to the work done by the combination as a whole. In his opinion herein, Judge Dietrich expresses the same view on this question.

The Court, in the Getty case, having found the

Getty pump not to be a *pendent* structure and not embracing a *substantial closure*, evidently referred to the so-called "circulatory" lubrication as illustrating the absence of any substantial obstruction or closure at the bottom of the shaft-enclosing casing. We cannot, for a moment, believe the Court would have found such Getty structure non-infringing if it had been *suspended* from the top of the well and had embraced a substantial closure *which did protect the shaft-bearings from the destructive action of the sand*.

In other words, closure at the bottom of the conduit must be sufficient to protect the shaft-bearings from the destructive action of detritus. *But such bottom closure is immaterial as a feature of lubrication*. When the lubricant reaches the bottom of the casing, it has completed its lubricating function.

However, there is no similarity between the Getty so-called circulatory system and the defendants' "*stagnant*" system in which the heavy lubricants remain in the casing for years. Also, the mere fact that some of the emulsifying oil and possibly some of the heavy grease, passes out of the bottom of the defendants' casing is immaterial. In the Layne structure, lubricant likewise passes out of the bottom of the casing. This fact is expressly found in the *Getty* as well as in the *Van Ness* cases. In the *Getty* case, the Court says that the Layne mechanical means *plus* "the downward pressure of the column of oil in the shaft-casing, accomplished his closure." Of course, the oil could not aid in excluding the water unless the oil



itself was able to pass down the passage up which the water tended to flow. Layne's testimony herein is to the same effect.

The sum and substance of this Getty decision is that the finding of non-infringement is predicated upon substantial differences in respect to *all three* of the functions performed by the shaft-enclosing casing in respect to alinement, closure and lubrication. The decision is not based on any one difference but *upon all the differences*. It is the *aggregate* of the differences that prompted the Court to find the Getty structure to be substantially different from the Layne structure. As said by the Court, in conclusion:

"Referring the closed shaft of Layne to the description in the specifications of his patent, as we must do, we think the differences from Getty's mechanism with respect to means of alignment, lubrication, and closure, are so important that Getty's differing means should not be held to be mechanical equivalents, and should not be held to infringe the *closed* shaft of Layne's patent."

In view of the foregoing, it cannot be said that this decision determines a difference, in respect to only one of said features, would be sufficient to sustain a defense of non-infringement.

#### E. PROFESSOR LESLEY'S TESTIMONY

In the majority opinion of the Court of Appeals, reference is made to the testimony of defendants' expert, Professor Lesley. As the majority opinion evidently places great reliance thereon, it might

suffice to call attention to the fact that Judge Dietrich, in the court trial, heard Professor Lesley give his testimony, observed his demeanor on the stand, heard the testimony of plaintiff's witnesses contradicting and disputing Professor Lesley's testimony, and determined the facts against the assertions of Professor Lesley.

As stated before, Professor Lesley's testimony is most significant in respect to experiments and tests he did not make and to questions not asked him by defendants' counsel.

Most of his testimony was based on experiments made with a pump structure specially installed, for the purposes of his tests, on the farm of E. W. Conant, father of the Western Well Works' engineer.

This pump structure was not proved to be a standard construction like the Anderson and other structures sold by defendants. Admittedly, the shaft-enclosing casing permitted water to enter at the respective joints between hubs and tube sections. In this respect, it differed substantially from the Anderson pump admitted by defendants' counsel to have tight joints sealed with white lead.

The professor's tests with such a *special* structure, not proved to be substantially identical with defendants' standard product, necessarily could have no value.

Query: Why did not defendants have Professor Lesley test a standard construction that had been sold and was in successful operation to the full satisfaction of the user thereof?

As said by Judge Dietrich:

"THE COURT—If you intend to show that, you may proceed; but it would be immaterial to show that any particular pump leaked, except perhaps by way of illustration of a general statement of opinion or theory on his part, that it would be practically impossible to construct a pump in the manner in which this is constructed that is water-proof" (R., 743).

However, Professor Lesley made no such general statement because defendants' counsel refrained from asking him any question which might call forth an opinion of such nature. Counsel refrained from asking such a question notwithstanding the following colloquy made it almost obligatory on his part to do so if he expected the professor's experiments to be accorded any weight:

"THE COURT—Is it your contention, Mr. Townsend, that the witness will testify that a mechanism constructed in the manner in which apparently this one was, with the use of white lead in the joints, cannot be made water-tight?

MR. TOWNSEND—Cannot be made water-tight?

THE COURT—Yes.

MR. TOWNSEND—That would be perhaps a difficult proposition to prove.

THE COURT—A man who is an expert in mechanical construction ought to be able to express an opinion about that" (R., 742).

*Professor Lesley was not asked to express any such opinion.*

Also, in respect to the lubricant used and the

vibration of the shaft, such test pump admittedly differed from standard construction. The professor admitted that, in defendants' structure at Stanford University, heavy cup grease was applied but no use thereof was made in the Conant specially prepared test pump (R., 765). There was appreciable vibration in such special "test" pump, but the Stanford installation was "rather free from vibration." It was "not enough to have any appreciable effect,—enough that I could observe," said Professor Lesley (R., 762).

Furthermore, his experiments with his specially designed apparatus, embracing bearings having spiral grooves, were not under working conditions. He made tests with water and with water and oil. Why did he not test such apparatus after the application thereto of graphite grease, cup grease and heavy oil? With the grooves filled with heavy grease, as Mr. Doble found them at the Selby ranch? Why did he not measure the rapidity of flow of such heavy grease through such grooves? He did state the pressure increased with an increase of viscosity. Is it not apparent that the rapidity of flow would necessarily decrease with such an increase of viscosity? The presence of such heavy grease on the shaft, above the bearings and in the grooves, after long use, shows that such heavy grease does not move through the grooves with rapidity but must be moved only at an exceedingly slow rate. Otherwise, the grease would have disappeared from all but the lowest tube-section at the top of which is located the last bearing having grooves. The professor's failure to measure such rate

of flow while measuring the pressure, suggests that possibly the exact rate of flow was not desired to be ascertained because it was feared same would be inconsistent with defendants' contentions.

Judge Dietrich's attitude, towards Professor Lesley's testimony and tests, is indicated in the following remarks:

"THE COURT—That is true, but tests might have been made of regular installations. As I have suggested, the difficulty about this is not that the Court is going to find there was any bad faith in a particular experiment, especially on the part of Professor Lesley, but the question, however, is as to whether or not the installation here was made precisely as installations ordinarily made. It appears to the Court that it would be very easy to affect the operation of this pump in respects to which you refer by slight changes in the actual installation. It may or may not be that there would be this circulatory system rather than that the system would act as a circulating system of lubrication if no water entered the tubing. Possibly the water has something to do with making efficient the circulation of the oil. There is this further suggestion in connection with this particular installation as it appears from the testimony of Professor Lesley, that when it came to installing the pump at Stanford University, there was apparently introduced into the tubing the usual amount of hard grease, or heavy oil—that which was somewhat immobile, at least, whereas, for some reason, that was omitted from the particular installation at which the test was made. It does not appear why. It may or may not be that that has something to do with the entry of water into the tube, or the circulation of water, or the circulation of the oil."

F. DEFENDANTS' STRUCTURE EMBODIES ALL ELEMENTS OF THE RESPECTIVE COMBINATIONS COVERED BY GENERIC CLAIMS 9, 13, AND 20.

From the foregoing, it is apparent that defendants' structure embodies each and every element specified in the three claims held infringed. The said elements are interrelated and combined together in defendants' structure in precisely the same way as disclosed in the Layne patent and perform the same functions to accomplish the same result. As found, *as a fact*, by Judge Dietrich herein, in respect to the Layne patented structure and defendants' structure:

"While in the unassembled parts there are many minor differences of construction, in the assembled structures I find no substantial distinction. Both accomplish the same result by substantially the same means, operating in substantially the same way."

In other words, defendants' structure is a deep-well pump mechanism, adapted to be assembled, *unit by unit*, at the mouth of the well-bore, and lowered, *unit by unit*, into the well-bore and, when completely assembled and lowered, to hang *pendent* from the surface, like a plumb-bob; said mechanism consisting of, in combination:

- (1) a *pump-impeller* attached to a
- (2) *sectional line* or *power-shaft* extending to the top of the well;
- (3) a *pump-casing* enclosing the pump-impeller;

- (4) a *water-discharge sectional casing* extending from the pump-casing to the top of the well;
- (5) a *sectional shaft-enclosing casing* extending from the pump casing to the top of the well, said casing being provided at each end of each section with a fixed block with bearings for the shaft and being closed at the top and provided with an air vent, and said casing being adapted to:
  - (a) hold the line shaft in alignment by means of said bearings fixed within said casing at suitable intervals;
  - (b) protect the line shaft and its bearings from the destructive action of the sand and other detritus carried by the water being pumped.
  - (c) form a conduit for lubricant from the upper end thereof down through each shaft-bearing therein, thus lubricating all the shaft-bearings, in series.

#### MECHANICAL EQUIVALENTS

LAYNE PATENT NOT LIMITED TO THE PRECISE DETAILS  
OF CONSTRUCTION SHOWN IN DRAWINGS.

We challenge defendants to show in the prior art any pumping mechanism wherein the power-transmitting shaft is associated in combination with an enclosing conduit or pipe, which conduit or pipe is made in sections, whereby the enclosing conduit is made to perform the three functions of:

- (1) holding the power-shaft in alignment by means of bearings fixed within said casing at suitable intervals;
- (2) enclosing and protecting the line-shaft and such bearings from the destructive action of sand and other detritus carried by the water being pumped;
- (3) a conduit for lubricant from the upper end thereof down through each shaft-bearing therein, thus lubricating all the shaft-bearings, in series.

This was a broadly novel conception. It was an invention of great merit, as shown by the litigation over it.

Such a pumping mechanism was revolutionary in the art. It filled a long-felt want. It solved the problem of the dug-pit. It permitted deep bored or drilled water wells and obviated all requirements of man entering the well-hole.

This Layne invention was one of *very great merit*. It was fundamental and generic in character. After it was produced, it was generally adopted and used. Such enclosed line-shaft pumping mechanism has become the standard. It has driven all predecessors from use.

While the Layne invention may not have been a truly "*pioneer invention*," within the strict definition thereof in patent law, yet its revolutionary character is such as to stamp it entitled to the liberal interpretation of the courts.



As said by this Court in *Continental Paper Bag Co. vs. Eastern Paper Bag Co.*, 210 U. S. 405, at page 415:

"It is manifest, therefore, that it was not meant to decide that only pioneer patents are entitled to invoke the doctrine of equivalents, but that it was decided that the range of equivalents depends upon and varies with the degree of invention."

We submit that the majority of the Court of Appeals erred in treating the Layne invention as a narrow invention, limited to details of construction, and in denying to such invention any range of mechanical equivalents. We submit that, on the contrary, the rule applied by this Court in *Hildreth vs. Masstoras*, 42 Sup. Ct., Rep. 21, should have been applied. That the claims of the Layne patent should be construed and interpreted to cover the very substantial change in the well mechanism art made possible by Mr. Layne's broad inventive idea.

#### LAYNE'S ENCLOSED LINE-SHAFT PUMP NOVEL

FORTY-THREE YEARS OF DEVELOPMENT IN ART IMMEDIATELY PRECEDING LAYNE'S INVENTION PROVES IT NOVEL.

As said in the *Van Ness* case, Layne's invention "*filled a long-felt need*" in the art. Defendants' proofs, of forty-three years of development in this art, clearly show the nature of such "need" and wherein numerous prior inventors *failed* to solve the problem of supplying such "need."

## 1. CRANNELL PATENT

The prior patent, most relied on herein and heretofore discussed in the *Van Ness* case and other cases, is that issued on April 15, 1890, to Charles W. Crannell for "Compound Pump." Admittedly, this is a mere *paper* patent that never had any influence on the progress in this art and which discloses a device that was never used. This alone indicates some fatal defect inherent in Crannell's apparatus.

As said by this Court in *Carnegie Steel Company vs. Cambria Iron Works*, 185 U. S., 421:

"This defense presents the common instance of a patent which attracted no attention, and was commercially a failure; being set up as an anticipation of a subsequent patent, which has proved a success, because there appears to be in the mechanism described a possibility of its having been, with some alterations, adaptable to the process thereafter discovered."

Figure 1 of the Crannell patent is reproduced on the opposite page. An inspection thereof discloses that the Crannell pump was designed only for low lifts. It is perfectly apparent that it would be wholly impractical for deep wells. It is, of course, equally apparent that it could not be used in the small bore of a well. It embraces many of the objectionable features found in the "pit pump" installations and which features Mr. Layne sought to and did eliminate by his invention.

This Crannell pump requires the digging of a pit

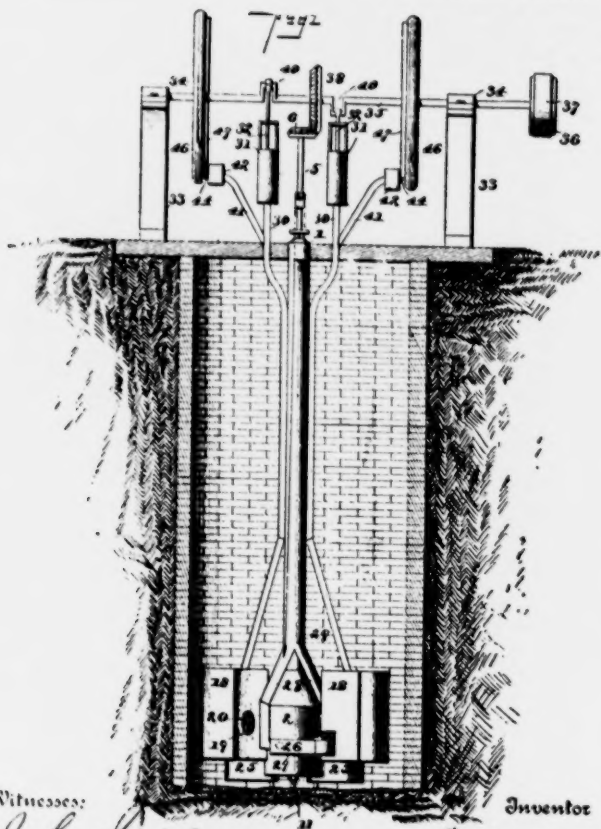
(No Model.)

2 Sheets—Sheet 1.

C. W. CRANNELL.  
COMPOUND PUMP.

No. 425,933.

Patented Apr. 15, 1890.



Witnesses:

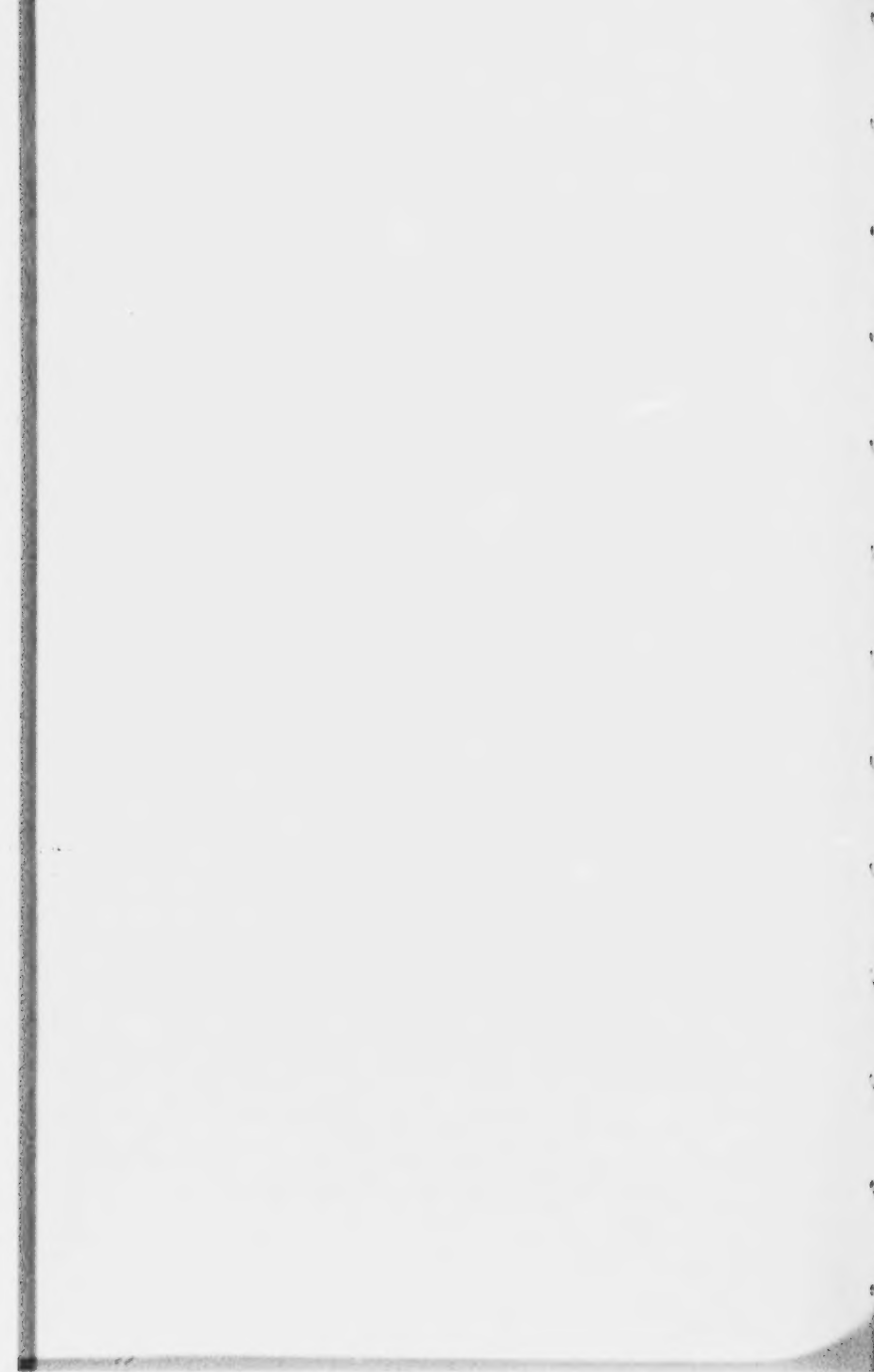
*John Irvine*  
*W. S. Dewar*

Inventor

*Charles W. Crannell*

By his Attorneys

*Cash & Co.*



within which the pump is installed by mounting the pump on the bottom of the pit. In other words, it is not adapted to be suspended from the top of the well or be assembled, *unit by unit*, at the top of the well and then be lowered, *unit by unit*, into the well. To install said pump and thereafter keep same in repair, it would be necessary for man to enter the pit. Such operations would require the water in the pit to be first removed. The said pump is not adapted to be raised or lowered in the well according to the variations in the level of the water therein.

This Crannell structure discloses no solution of the problems confronting Layne and contains no suggestions of such a solution.

On the contrary, the Crannell pump does not provide, in a pendent power-transmission (a) a tubular enclosure associated with a series of shaft-supporting and alining bearings spaced at suitable intervals along the shaft, thereby supporting the shaft; nor (b) a tubular enclosure substantially *protecting* the shaft and alining bearings from the water in the well, and being pumped, and from sand or other detritus carried by such water; nor (c) a tubular enclosure forming a *conduit to convey the lubricant* to the several bearings of the shaft in series. The Crannell patent, in fact, does not in any manner solve the problem, which was presented to Mr. Layne, of how could he assemble the necessary intermediate bearings and still use a tubular conduit about the pump-shaft and utilize such conduit to effect *alinement, protec-*

*tion and lubrication* of the bearings in series. As will hereafter appear, the inventor and patentee, *Alvord* (an engineer of years of experience in this art), was unable to solve such problem, which proves the solution thereof was not obvious even to an inventor in this art. The disclosure of the Crannell patent would teach an ordinary mechanic in the well art (having knowledge of the Layne invention derived from the Layne patent or installations) to install a pump in a large open pit and rest the installation on the bottom of the pit. It would not suggest to him a *pendent* structure installed in a bored well. It would not suggest to such mechanic the idea of assembling the pump-shaft bearings and enclosing conduit or tube, section by section as units above the ground, as conceived and patented by Layne and as copied from Layne by the defendants. The general construction of the pump and of the air chambers of the Crannell patent would preclude the possibility of such pump being used in a bored well.

The drawing and description in the Crannell patent clearly indicate that Mr. Crannell did not appreciate the necessity of lubrication of the bearings through the pump stock. Should an attempt be made to introduce lubricant into the "pump stock" of the Crannell patent, such lubricant *could not reach the shaft-bearing*. On the contrary, it would escape into the water being pumped and this without doing any useful work of lubrication whatever. *The only bearing shown in the pump is bearing 9, below the triple-bladed screw*. No means are suggested for lubricat-

ing this bearing. In such a structure, none could be provided. This bearing is exposed to the water in the well and being pumped. No protection therefor is provided. In such a structure, none could be provided. Any sand or detritus, carried by the water, would immediately cut this bearing. The pump would not last three hours under such conditions, *any more than did the United Iron Works' unprotected bearing pump installed on a Palo Alto ranch, as testified to by the defendant Vaughan.*

This Crannell patent conclusively shows that Crannell had no conception of a deep-well pump. No one, searching the art and having no previous knowledge of the Layne patent or invention, would receive any suggestion whatever from this Crannell patent of building a well mechanism of the Layne type wherein is provided a shaft *alining* and *protecting* casing, which includes a plurality of shaft alining and supporting bearings in series spaced at suitable intervals therein, whereby a *conduit* is provided to convey the lubricant to the several shaft-alining and supporting bearings in series and whereby provision is made so that the several bearings may be inserted or assembled and held in position, and which conduit *protects* the shaft and the bearings from the action of the water in the well and being pumped, and from any sand or detritus carried by the water.

It is interesting to note that Crannell devised a mechanism which included a tube surrounding part of the pump-shaft, yet he did not appreciate the possi-

bilities of the Layne invention. His approximation did not lead him to a conception of the exceedingly simple, efficient and remarkably valuable Layne invention. The Crannell patent, instead of anticipating or limiting the scope of the Layne invention, serves on the contrary to emphasize its character as an invention. The Crannell patent shows conclusively the meritorious character of Layne's conception. As said by this Court in *The Barbed Wire Case*, 143 U. S., 282:

"Under such circumstances courts have not been reluctant to sustain a patent to the man who has taken the final step which has turned a failure into success. *In the law of patents it is the last step that wins.*"

Judge Jack, presiding at the trial of *Getty vs. Layne*, in the District Court, seemed to think insertion of intermediate bearings in the Crannell disclosure very similar to inserting additional fence posts in a fence. Judge Jack, however, failed utterly upon his mechanics. He overlooked the fact that, to insert such intermediate bearings was not *mere* insertion of intermediate bearings. The problem was, *how could such intermediate bearings be placed in position; how could they be supported; how could they be alined?* How could these things be done and yet avoid the necessity of man entering the well-hole? How could the enclosing conduit be made to support and permit the insertion of such intermediate bearings and how could lubrication of all these bearings be provided?



The fact that this *was a problem* is demonstrated by the *Alvord* patent No. 735,690, hereinafter discussed. Alvord wanted to insert intermediate bearings. So he had to depend upon water lubrication. *He had to permit the water to carry sand and detritus into his bearings.* Why? Because, to insert such intermediate bearings, he could conceive no method other than to provide *openings* at stated intervals along his enclosing pipe so that the intermediate bearings could be put in place and alined. This is not our thought; *this is the fact as shown by the record.* Mr. Alvord could perceive no other solution of the problem.

We submit that the Court is not going to decide this case upon mere speculation. Like any other law-suit, the case is to be determined upon proofs. The proofs here are that Crannell did not have the Layne idea; Crannell did not have any idea of intermediate bearings; he did not have any idea of how he could assemble such bearings or lubricate them or protect them or hold them in alinement. The *proof* is that Alvord *could not solve* such problem *and he was an inventor in this art.* On the contrary, the proof is that Mr. Layne was the first man in the art who ever conceived an enclosed line-shaft construction whereby the pump-shaft could be surrounded by an enclosing conduit and such enclosing conduit provide for the alinement and support of the necessary intermediate bearings, and also provide for the lubrication in series of such bearings and provide for a sufficiently tight shutting off or closure of the pump-

shaft bearings from the water being pumped and the sand and detritus carried thereby to insure the life of such power-transmitting mechanism.

The Crannell patent is discussed by plaintiff's witness, W. A. Doble, Sr., at page 825 of the record.

## 2. EISLER PATENT

The Eisler patent, like the Crannell patent, was before the Circuit Court of Appeals for the Fifth Circuit in the Layne patent litigation above referred to.

This Eisler patent, issued on July 3, 1894, also discloses a low lift pump arranged to be supported on the floor of an open flume or canal. This structure is not one capable of being assembled, *unit by unit*, at the top of the well and, *unit by unit*, lowered into the well and there hang pendent. It does *not* embrace any shaft-enclosing casing which, like Layne's, functions to *protect* the shaft and bearings, to *aline* the shaft-bearings and to form a *conduit* for lubricant.

This patent is also discussed by plaintiff's witness, Doble, at page 825 of the record. As said by him, the bearings therein are not protected from the destructive action of the sand, etc., in the water being pumped. Furthermore, no lubricant is conveyed to said bearings by means of any casing enclosing the shaft-bearings.

This Eisler structure, with its unprotected bearings, would last no longer than did the United Iron Works' pump, referred to by the defendant, Vaughan,

and which became inoperative within a few hours by reason of the unprotected shaft-bearings being destroyed by the sand in the water being pumped. Said pump was replaced by one of defendants' structures which operated successfully solely because it embodied Layne's invention.

### 3. IVENS PATENT

This patent was issued in July, 1902. It obviously does not disclose or suggest the Layne invention.

### 4. ALVORD PATENTS

The three patents issued to J. W. Alvord of Chicago, Illinois, are of great importance in respect to conclusively proving the difficulty of the problem solved by Layne and the fact that it required invention, of a high order, to solve such problem.

The Alvord patents are respectively numbered 735,690, 735,691 and 735,692, and were all issued on August 11, 1903. The first one was applied for on November 17, 1902, and the last one on March 30, 1903.

Mr. Alvord was, therefore, an inventor who was attempting to solve the deep-well problem *shortly after the time* when, in April, 1902, Mr. Layne made his invention. Both these inventors, therefore, had the benefit of the same prior art relied on herein by defendants and disclosing forty-three years of development in this art.

If such prior art, as contended by opposing counsel,

was *so suggestive* of Layne's solution of the problem that any ordinary skilled mechanic could have solved such problem in the way Layne did, then we would naturally expect to find Mr. Alvord, an *inventor*, not merely a mechanic, also being able to solve such problem.

However, the Alvord patents show Alvord's efforts resulted only in an inoperative structure. Notwithstanding all the "*alleged suggestiveness*" of the prior art, relied on herein, said art did not, *in fact*, suggest to the *inventor*, Alvord, a successful solution of the problem. In other words, the Alvord patents *show* "*what was not seen*" by an inventor in this art, who was almost a contemporary of Mr. Layne.

As said by this Court in *Diamond Rubber Co. vs. Consolidated Rubber Co.*, 220 U. S., 435:

"Knowledge after the event is always easy and problems once solved present no difficulties, indeed may be represented as never having had any and expert witnesses may be brought forward to show that the new thing which seemed to have eluded the search of the world was always ready at hand and easy to be seen by a merely skillful attention. *But the law has other tests of the invention than subtle conjectures of what might have been seen and yet was not.*"

The Alvord defense is not a new one. Mr. Alvord testified on behalf of the defendant in the *Van Ness* case, wherein he stated he was the patentee to whom were issued the said three Alvord patents.

The Alvord tube, surrounding the shaft, is not

intended to and *cannot protect* the shaft and bearings from the destructive action of the detritus carried by the water being pumped. Furthermore, said tube is not intended to and *cannot operate as a conduit* for conveying lubricant to the bearings. Alvord was compelled to rely on the water itself to lubricate the bearings and, as the record shows, the detritus, carried by such water being pumped, will destroy unprotected bearings within a few hours.

The Alvord patent No. 735,690 shows a construction in which every intermediate bearing for the pump shaft is *directly open to the water being pumped from the well*. Sand or other detritus, carried by the water, may enter the bearings. *The bearings are not protected in any sense*. This alone is sufficient to demonstrate the utter lack of pertinency of the so-called Alvord invention to the issues of this case. Alvord had to depend upon water lubrication because he was unable to provide means to convey oil to his shaft bearings. This patent does show that Mr. Alvord contemplated enclosing the pump shaft in a tube 7. He also contemplated the insertion of intermediate bearings for the shaft, but, in order to assemble his intermediate bearings, etc., it was necessary to provide an opening through the pipe or "shaft-tube" just above each bearing. In addition to the holes in the "shaft-tube" opposite each bearing adjusting-screw 15, said tube is open, to the water being pumped, at the slots 19. The result of this was that the water being pumped was free to flow into the "shaft-tube" just above

each bearing and through each slot 19. And sand or detritus carried by the water was, therefore, carried *directly* to the bearings. The result of such construction would be the same as that testified to by defendant Vaughan. Mr. Vaughan admits the pump at the Selby ranch (installed by the United Iron Works) lasted only a few hours because of the destructive action of the sand upon the bearings. *This was due to the lack of Layne's protective casing.* The reason for Mr. Alvord requiring the openings through his "shaft-tube" just above each bearing was to enable the assemblage of the devices in their respective relations and positions. Without such openings Alvord could not assemble his structure. With said openings therein, his tube cannot form a conduit for lubricant and cannot protect the bearings. Layne, however, provided such a relation of his sectional shaft-enclosing conduit and intermediate bearings so that the necessary intermediate bearings could be assembled and could be protected, held in alinement and lubricated in series. This was and is impossible without entire rearrangement, reconstruction and redesigning of Alvord's mechanism.

How Alvord's scheme could be used without providing the openings through the "shaft-tube," just above each bearing and slots 19, is not apparent. *Alvord never conceived how it could be done.* He never showed how it could be done. And it remained for Mr. Layne to provide such a combination as would insure the lubrication and protection of the interme-

diate bearings. This Alvord patent No. 735690 is a very fine illustration of how *not* to accomplish the desired results sought and secured by Layne.

The Alvord patents Nos. 735691 and 735692 do not illustrate the "shaft-tube" and intermediate bearings. This feature of Alvord's ideas is covered by his patent No. 735690.

There is nothing at all comparable in this Alvord patent No. 735690 with the Layne enclosed line shaft invention having its features of lubrication, alinement and closure. This Alvord patent illustrates the paucity of the prior art *rather than placing any limitation whatever upon the scope of the Layne invention.*

#### DEFENSE OF PRIOR INVENTION BY BYRON JACKSON.

Defendant's answer pleads that the Layne patent, and particularly Claims 9, 13 and 20 thereof, are void for the reason that the subject matter thereof was invented by Byron Jackson, of San Francisco, California, prior to the alleged invention thereof by Mr. Layne. (Par. XV of amended answer, R. p 26.)

*However, defendants make no contention that Byron Jackson ever built any anticipating pump. The first pump made by him and claimed by defendants, to embody Layne's invention, was not built until December, 1903, or January, 1904, almost eight months after Layne's constructive reduction to practice by the filing of his patent application on April 28, 1903.*

In the Circuit Court of Appeals for the Ninth Cir-

cuit, defendants' attorneys expressly disclaimed making any contention that Byron Jackson ever made any anticipating pump. In defendants' brief filed in said Court, at page 40 thereof, defendants stated:

"Let it be clearly understood at the outset that defendant does not contend that the Byron Jackson pump was *completed and operated* prior to Layne's filing date. Such 'completion and operation' are *not* necessary to a defense of *prior invention or prior knowledge*. (Italics defendants'.)

We shall discuss this Byron Jackson defense because, although *not* herein sustained by the Circuit Court of Appeals, it is referred to by Judge Morrow in construing the Layne patent claims *as being limited to a shaft casing from which no lubricant escapes*.

The same Byron Jackson defense was also held *not* sustained in the case of *Layne & Bowler Corporation vs. American Well and Prospecting Company et al.*, in the United States District Court for the Southern District of California, by Special Master Lynn Helm, appointed to hear, try and determine that case.

The uncontradicted proofs show Layne conceived his invention as early as April, 1902.

As Layne exercised *reasonable diligence* in filing, on April 28, 1903, his application for letters patent on his invention, the *date of said invention* must be deemed to be April, 1902.

Therefore, to sustain this Jackson defense, it was necessary for defendants to prove that, prior to April,



1902, Jackson conceived the same invention and, with *reasonable diligence*, either reduced the same to practice or filed an application for letters patent thereon.

However, defendants failed to introduce any proofs showing even any completed "*conception*" by Jackson prior to the filing of Layne's application on April 28, 1903. Furthermore, defendants' proofs disclosed that Jackson *never* applied for letters patent on such invention, and the first pump, made by him and claimed to embody Layne's invention, was not built by Jackson until *about eight months after the filing of Layne's application on which was issued the letters in suit*.

From the foregoing, it is apparent that, even though it were *admitted, contrary to the proofs*, that Jackson had a *mental conception* of said invention prior to Layne's conception, nevertheless Jackson could not be held to be a prior inventor *because he exercised no diligence* in reducing his mental conception to practice and, therefore, could not be entitled to the *date of his mental conception* as the *date of his invention*. As said in *Robinson on Patents*, at page 150:

"Section 961. Third Defense: Denial that the Alleged Inventor was the first Inventor of the Patented Art or Instrument.

The third defense consists in a denial that the patentee or his assignor performed the inventive act producing the alleged invention *at an earlier date than any other inventors in this country*. This defense concedes that the patentee or his assignor is a true inventor of the art or article in question,

but denies that he was its *first* inventor. It is equivalent to either of two averments: (1) 'That rival inventors had completely conceived the idea of means embodied in the invention, *and were using diligence in reducing it to practice at the time when the patentee or his assignor conceived the same idea*; or (2) that although the patentee or his assignor had *first conceived* the idea, *he did not use due diligence in reducing it to practice, and that in the meantime some later conceiver but more prompt reducer had perfected the invention*. This defense raises the same issue which is presented in interference cases in the Patent Office and in proceedings in equity to annul a rival patent, and is sustained when the evidence establishes either one of its equivalent averments."

As defendants made no attempt to fix the date of Jackson's alleged conception by reference to any proofs showing a completed conception, in our Brief in the Circuit Court of Appeals, we stated:

"It is to be noted that defendants, in their Brief do not attempt to point out *when* Byron Jackson had a complete conception of the Layne invention. Defendants do not refer to any written description, to any letter or to any drawing, completed prior to Layne's filing date or prior to the date upon which Layne's application was signed (April 3, 1903), from which the Court can find a completed idea or conception of the Layne invention."

Prior to referring to this Jackson defense, Judge Morrow, in his opinion, found, *contrary to the finding of the Circuit Court of Appeals for the Fifth Circuit*, that Layne's shaft-casing did not perform the function of alining the shaft bearings and shaft. He then found

that Jackson had a conception of other features of the Layne invention excepting the alleged complete closure of the Layne shaft-casing. In support of such finding, Judge Morrow quotes from numerous letters written *after* Layne executed his application for the letters patent in suit and in one of which letters, dated April 29, 1903, Jackson admits "*no such pump had been developed.....*" This admission, alone, was sufficient to negative any contention that Jackson, prior to said letter or prior to Layne's application, had a *complete* mental conception of *any* proposed pump discussed in the letter. So far as Jackson was concerned, his ideas, at that time, were still inchoate.

Furthermore it is to be noted that Judge Morrow, like defendants' attorneys, failed to point out *when* Jackson had a *complete conception* of *any* invention and failed to refer to any written description, to any letter or to any drawing, completed prior to Layne's application date or prior to the date upon which Layne's application was signed (April 3, 1903), from which the Court could find a completed idea or conception of the Layne invention. Judge Morrow's views, in reference to the Jackson defense, were evidently based on what appeared in Jackson's letters written *after Layne had filed his patent application*.

Furthermore, Judge Morrow failed to discuss and apparently failed to consider the *question of diligence* in determining the *date* when Jackson could be said to have made a completed invention of any character.

As said before, *admittedly Jackson made no anticipating pump and did not make any pump*, claimed by defendants to embody Layne's inventions, *until about eight months after Layne filed his patent application*. And, in such *subsequent Jackson pump*, Judge Morrow did *not* find embodied the Layne shaft-casing performing the function of alining the shaft-bearings and shaft.

From the foregoing outline of the situation, it is apparent the Byron Jackson defense should have no effect on the scope of Layne's patent claims. The said defense was also overruled by trial Judge Dietrich and by Circuit Judge Gilbert. It was also overruled by the Special Master in the case of *Layne & Bowler Corporation vs. American Well and Prospecting Company et al, supra*.

Judge Morrow's findings herein may be attributed to his confusion of the various and very differently functioning casings mentioned in the Layne patent claims in suit. In his opinion, at page 1127 of the record, (276 Fed. top page 468), Judge Morrow made the following findings:

"We find also that the combination with a 'pump-casing' mentioned in clause 2 of claim 9, the 'closed casing surrounding the pump-shaft' mentioned in clause 5 of claim 9, the 'sectional casing' mentioned in clause 4 of claim 13, the 'casing being closed at the top' in clause 8 of claim 13, and the 'well-casing' of clause 2, claim 20, by which the pump is 'entirely closed off from the

water in the well' mentioned in the last two words of clause 4 and in clause 5 of claim 20, perform the same function . . . "

In said quotation, *three* separate and distinct casings, respectively performing entirely different functions, are spoken of as being *one and the same thing and performing the same function*.

The "Pump-casing," of claim 9, is numbered 21 in the Layne patent and, as clearly shown in Figure 1, is the casing that encloses the pump impellers. Judge Dietrich carefully notes this in his opinion. Obviously, said casing is not closed off from the water in the well. In order to operate the pump, the well water is permitted to enter the bottom of said casing 21 and said water, by the rapid rotation of the impeller within said casing, is forced out of said casing and up through the water discharge pipe 23 to the surface of the ground.

The "closed casing," of Claim 9, is the shaft enclosing casing numbered 20 in the Layne patent. This casing is supported at the top of the well and hangs pendent therein, like a plumb-bob. So hanging in a vertical plane, it maintains in vertical alinement the shaft-bearings mounted therein and thus maintains the shaft in vertical alinement. This casing also forms a conduit down through which the lubricant passes and lubricates, in series, the said shaft-bearings. This casing also prevents the water and sand therein from coming in contact with the shaft bearings and thus destroying them.

The "well-casing," of Claim 20, is numbered 16 in the Layne patent and forms an inner lining for the well-bore to prevent caving in of the ground surrounding the bore of the well.

In the above quotation, His Honor, Judge Morrow, has erroneously treated these *three separate and distinct casings* as one and the same thing. Therefore, in construing Claims 9, 13, and 20, he has treated these *three distinct elements* thereof as *being only one element*. This confusion of these various elements may have been the reason for much of the conflict between the Circuit Court of Appeals' decision herein and the various prior decisions of the Circuit Court of Appeals for the Fifth Circuit.

Unquestionably such confusion of the mechanics involved must have led to a confusion in Judge Morrow's conclusions and findings. It is to be noted that Judges Dietrich and Gilbert were not misled by any such errors as to the mechanical facts.

Whatever incomplete conception or idea Byron Jackson had on April 29, 1903, (*after Layne had filed his application for the patent in suit,*) it is clear that Byron Jackson had not at that time done anything with such idea,—whatever it was,—for he says in his letter of April 29, 1903, to his agent Mead:

*"but at present no such pump has been developed."*

Here is a direct acknowledgement by this manufacturer of pumps that he had not, at the time Layne filed his application for the patent in suit, developed even the pump that he was writing about. It is to be

born in mind that this letter does not describe Layne's shaft-enclosing casing construction, with its three functions of alinement, protection and lubrication.

Very significant, in this connection, is Byron Jackson's letter to Mead under date of April 29, 1903 (R. pp. 118 to 120). When referring to this same matter, Byron Jackson says:

"It is true that this design of a pump does not take very much material or work after it is once developed, but at present no such pump has been developed."

Here is a direct admission by Byron Jackson that he had not prosecuted the matter with diligence; he was a manufacturer of pumps, and had been for years. Yet, if he had any conception of Layne's invention, (of which there is in fact no evidence,) he laid such conception aside, and did not reduce it to practice either by making and testing out an actual pump, or by filing an allowable application for patent thereon.

Analyzed as a defense of *prior invention*, the defense utterly fails. This defense is predicated upon the theory that, before Layne conceived his invention, Byron Jackson had conceived *the same invention* here in issue. But mere conception of an invention does not make one the first "inventor" in law. To merely have a mental idea (although it may be a *complete* idea), as to all the mechanical parts or devices to be assembled together, is not to have completed the in-

vention. Necessarily, every invention must be first conceived or thought out before it is put into actual embodiment in a machine or device. However, mental conception alone is insufficient to form the foundation of any right. Furthermore, merely explaining such an idea to another or making drawings is insufficient. *Either an actual reduction to practice of the invention or a constructive reduction to practice is necessary to establish one's right to an invention.* This is fully discussed in *Automatic Weighing Machine Co. vs. Pneumatic Scale Corporation*, 168 Fed. 288, the leading case on the subject.

In order that an inventor, who has reduced an invention to practice (either actually or constructively), may reach back *for his date of priority* to his conception of the invention, two things are necessary. First, he may not carry the date of his invention back before he had a concrete idea of the completed invention. That is to say, he had no conception of the invention at the date on which his idea was intangible, inchoate or incomplete. He had no conception of a given invention unless his mental idea of that invention was so complete that, put in mechanical embodiment as he then had it in his mind, it would be a complete and operative machine or device embodying the inventive idea in question. Second, having had such a concrete and complete conception of the given invention, such inventor must, *with reasonable diligence*, (i. e. that diligence usually exercised by a prudent business man,



pursuing business matters of usual importance), *reduce the invention to practice*.

It, therefore, is necessary to consider the so-called Byron Jackson defense from this standpoint. It is conceded that the Pabst pump was not completed until December, 1903, or January, 1904. In this connection, it must be remembered that the pipe, for the shaft-enclosing conduit, was purchased in Milwaukee and not sent from San Francisco. Byron Jackson never filed an application for patent on this subject matter. Therefore, there was no *constructive* reduction to practice.

What then is to be made of defendants' assertion that Byron Jackson was diligent? We believe that, from the time in April, 1903, that he took up the question of working out and designing a pump for this Pabst well, to the date when the pump was installed in the well, Byron Jackson was diligent. But the difficulty is,—Where is the evidence that Byron Jackson had a conception of the complete invention, here in dispute, at any time prior to May, 1903, or at any given time? No drawing has been produced that clearly and unmistakably shows the Layne combination; no written description, made prior to May, 1903, is produced which shows such a conception. On the contrary, Byron Jackson's letters to his agent Mead show that he was groping in the dark during April, 1903; that he had no complete conception himself of what he was going to do or what he intended to do.

It is to be noted that defendants, or Judge Morrow, do not attempt to point out *when* Byron Jackson had a *complete conception* of this Layne invention. Defendants do not refer to any written description, to any letter or to any drawing completed prior to Layne's filing date or prior to the date upon which Layne's application was signed (April 3, 1903), from which the Court can find a completed idea or conception of the Layne invention. This is necessary in order to sustain the defense of "prior invention." The burden of proof is on the defendants. Any reasonable doubt must be resolved against defendants. The more carefully the court analyzes the Mead-Jackson correspondence and scans the various exhibits and drawings, the more clear it will become to the Court that there is no proof that Byron Jackson had a conception of the complete invention prior to May, 1903.

Judge Morrow, speaking for the majority of the Circuit Court of Appeals, refers to the agreement drawn up April 20, 1903, by the Pabst Company, and submitted to Byron Jackson for his approval. It is to be noted, in this connection, that Judge Morrow evidently draws an erroneous inference from this contract. *First*, the proposed contract was the draft of a contract *as proposed by Pabst*. This was not accepted by Jackson. *Second*, while it states the problem, it does not describe or state *how* the problem is to be solved. That there is nothing in this provision of Pabst's proposed contract which would teach an ordinary me-

chanic, skilled in the art, how to construct such a pump, is demonstrated by Byron Jackson's own letters of March 31, 1902 (Rec. p. 101) and of April 14, 1903 (Rec. 102), heretofore quoted herein.

*Furthermore, this alleged description is too late.* Layne's application for patent was executed seventeen (17) days before the date of this exhibit. See page 4 of Layne's patent, lines 88-90: "In testimony whereof I have hereunto set my hand, *this 3rd day of April, 1903*, at Chicago, Illinois."

Furthermore, plaintiff proved Layne's date of conception to have been as early as April, 1902, which antedates any alleged conception on the part of Byron Jackson (Rec., 860; 868).

Plaintiff submits, therefore, that this defense of prior invention has not been established; that it was error for the majority of the Circuit Court of Appeals in this case to use it to whittle away the scope of the Layne invention. It was not a completed invention by Byron Jackson prior to Mr. Layne's filing date, and it had no effect upon Mr. Layne's rights to a patent. It is not a part of the art prior to Mr. Layne's invention and should and can not have any effect as subtracting therefrom any of Mr. Layne's fundamental, generic conception. Unquestionably Mr. Layne was first.

## CONCLUSION

We submit that the decree of the District Court was correct and should be affirmed; that the decree of the Circuit Court of Appeals is in error and should be reversed. That the decree of the Circuit Court of Appeals is based upon a misconception of the mechanics and of the mechanical facts involved in the case; that it is based upon findings of fact by the majority of said Court, disavowed by the minority, which findings are contrary to the preponderance of evidence; that Judge Dietrich's findings of fact should have been accepted, as the same are unassailable, (*Adamson vs. Gilliland, supra*); that said majority opinion is in error in its strict construction and interpretation and limitation of the scope of the claims of the patent in suit that liberality, rather than strictness, should prevail, where the court is dealing with an invention of the importance and standing in the art of that of the invention of Mr. Layne.

We submit that the findings of the Circuit Court of Appeals for the Fifth Circuit:

In the *Van Ness* case, that: "*Layne filled a long-felt need in the deep well irrigating business by his protective casing, and had invented a practicable and valuable improvement in the art and one entitled to protection for that reason, however theoretically its novelty and patentability may admit of doubt*";

In the *Getty* case, that: "The Layne patent . . . did accomplish a revolution in the well-drilling industry";

the findings of Judge Dietrich that: "Though not, strictly speaking, a pioneer, the patent is of a fundamental, generic character, and in expressing his conception in physical form the patentee is entitled to a reasonable range of mechanical equivalents." (R. p. 891);

and the findings and conclusion of Presiding Circuit Judge Gilbert in his dissenting opinion in the Court of Appeals, that: "There can be no doubt that the appellee's invention did, as was said in the case of *Getty vs. Layne* (C. C. A.), 262 Fed. 141, *accomplish a revolution in the well-drilling industry*. And while the invention may not be said to be of a pioneer character, it is, nevertheless, an invention of such merit as to be entitled to protection against a reasonable range of mechanical equivalents."

are correct, and that, as said by this Court in the *Paper Bag* case, 210 U. S., *supra*, *the mere substitution of mechanical equivalents cannot avoid infringement*.

This being true, the following remarks of Judge Coxe, in *Hallock vs. Davison*, 107 Fed. 482, 486, are most pertinent:

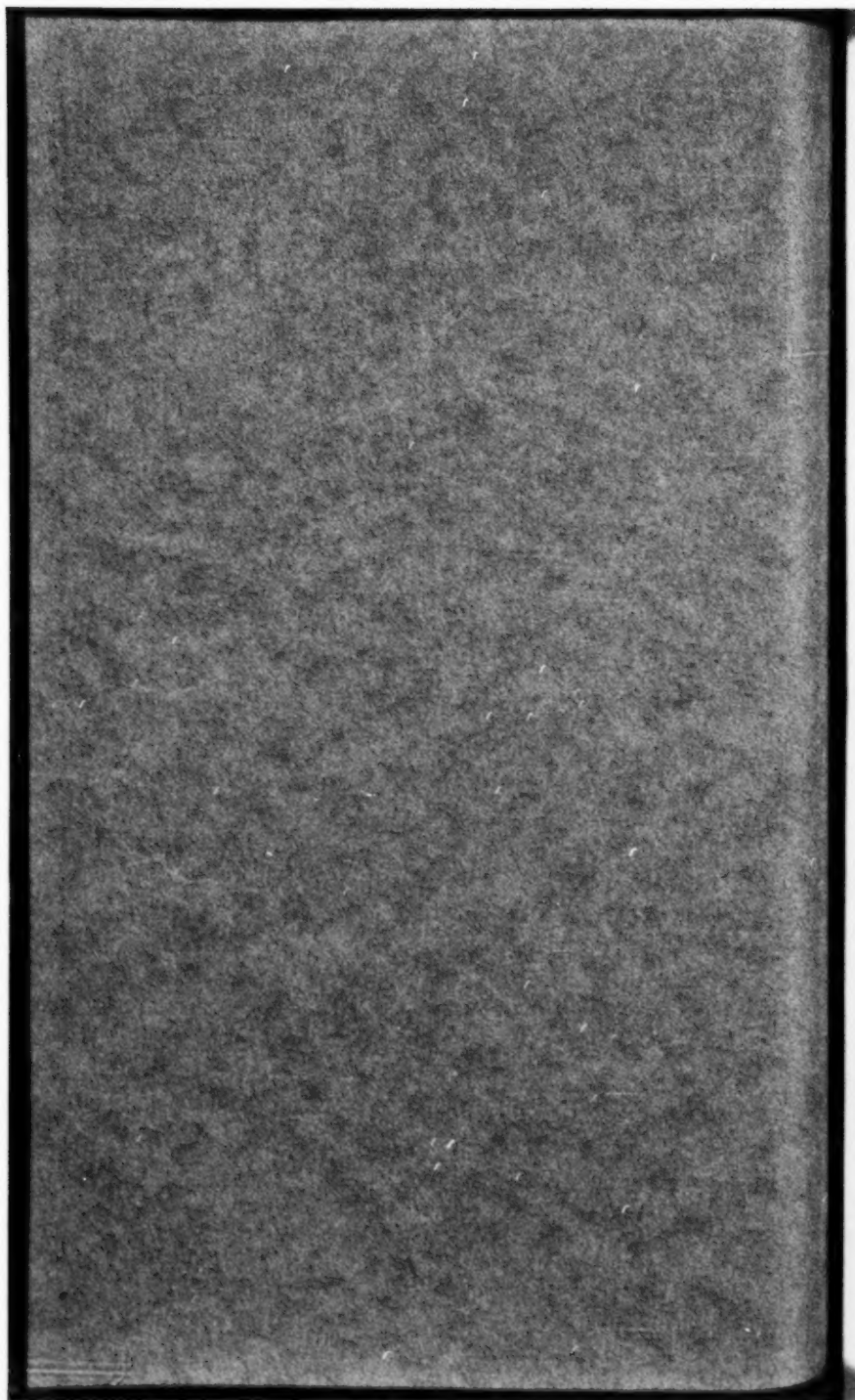
"If there be one central controlling purpose deducible from all these decisions, and many more that might be quoted, it is the steadfast determination of the Court to protect and reward the man who has done something which has actually advanced the condition of mankind, something by

which the work of the world is done better and more expeditiously than it was before."

Respectfully submitted.

FREDERICK S. LYON,  
LEONARD S. LYON,  
WILLIAM K. WHITE,

Solicitors and Counsel for Plaintiff-Petitioner.



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# In the Supreme Court

OF THE  
United States

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OCTOBER TERM, 1922

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No. 278

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LAYNE & BOWLER CORPORATION,

*Petitioner,*

VS.

WESTERN WELL WORKS, INC. (a corporation),  
ROTARY DRILLING AND DEVELOPMENT COM-  
PANY (a corporation), STANLEY M. HAL-  
STEAD, P. E. VAUGHAN and ALLEN W. ROSS,  
*Respondents.*

On Writ of Certiorari to the United States Circuit Court of Appeals  
for the Ninth Circuit.

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## RESPONDENTS' BRIEF

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### STATEMENT.

This is a suit for alleged infringement of Layne  
patent No. 821,653, issued May 29th, 1906, on an  
application filed April 28th, 1903, and purporting

to cover new and useful improvements in Well Mechanism. The suit is based upon claims 9, 13, and 20 of said patent.

The District Court for the Northern District of California found said claims valid and infringed. On appeal, the Circuit Court of Appeals for the Ninth Circuit reversed the decree in so far as holding that defendants' construction did not infringe said claims, though at the same time finding the patent valid. In so doing the Court of Appeals for the Ninth Circuit, speaking by Judge Morrow, in a carefully considered opinion (Record 1121-1148—reported 276 Fed. 465) followed substantially the Circuit Court of Appeals for the Fifth Circuit.

The case is now before this court on writ of certiorari.

For convenience the petitioner will be referred to herein as "plaintiff" and respondents will be referred to as "defendants".

---

#### ADJUDICATIONS OF THE LAYNE PATENT IN SUIT.

This court will be materially assisted in the construction of the Layne patent by what has been said about it by the various judges before whom it has come for review in the past. The other reported Opinions, to which the Court's attention is particularly directed, are all in the Fifth Circuit, to-wit:

The El Campo Case, 195 Fed. 83, C. C. A.  
5th Circuit;

The Van Ness Case, 213 Fed. 804, C. C. A.  
5th Circuit;

The Getty Case (on Preliminary injunction), 220 Fed. 918;

The Getty Case (on appeal from Final Hearing), 262 Fed. 141.

In addition to these four Opinions of the Appellate Court, there is the recent decision in the Los Angeles District in the American Well & Prospecting Company case, which case is, for convenience, referred to as the "Los Angeles case"; the report of the Master who was appointed by the court to hear the evidence and submit his findings appearing (R. ~~1812~~).

1072

The net result of all these decisions has been practically to construe the Layne patent to the level of a mere paper patent, valid only within very narrow limits. The Getty case *supra* may be taken as the leading case on the subject following as it does repeated reviews of the same question by the same court.

The gist of the Getty case was that the Layne patent was limited to a *stagnant* system of lubrication which was not infringed by a pump employing a *circulatory* system of lubrication. The logic and importance of such a distinction will be manifest in its application to the instant case.



The new defenses interposed here on the scope and validity of the patent must necessarily result in a further paring down of the claims in question, rather than any enlargement thereof. These new defenses are:

- (1) Byron Jackson prior invention and sale.
- (2) Alvord prior invention.
- (3) Eisler patent.

---

#### THE CLAIMS IN SUIT.

The claims involved are numbers 9, 13 and 20 (R. 1005) and read as follows:

"9. In well mechanism the combination with a pump casing, of a rotary pump of a jointed pump shaft and a closed casing surrounding the pump shaft from the pump to the top of the well.

"13. The combination with a pump and its actuating shaft of a sectional casing therefor provided at each end of each section with a fixed block with bearings for the shaft, the casing being closed at the top and provided with an air vent.

"20. The combination of a well casing, a rotary pump therein, and a line shaft for the pump entirely closed off from the water in the well."

Having read the El Campo, Getty and Van Ness decisions, *supra*, and Judge Morrow's opinion in

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NOTE—In the Van Ness case, *supra*, the court found (page 807) that:

"The word 'closed' in claim 9 seems to mean as much as the words 'entirely closed' in claim 20."

and proceeded to hold the two claims to be substantially alike.

the Western case, the meaning of these claims as interpreted by the several appellate tribunals will in a large measure have become apparent to this court.

We shall, however, in due course point to what we think is the true meaning of these claims and show that whatever that meaning is, whether that given by the Fifth or Ninth Circuit Judges, that defendants do not and never did infringe.

---

**MEANING AND SCOPE OF THE CLAIMS IN SUIT.**

Throughout the litigation that has been carried on over the Layne patent the proponents of Layne have urged upon the various courts the reading into these claims of functions and elements not apparent on the face of the claims, nor, indeed, deducible from the description and drawings of the patent. Even though the Circuit Court of Appeals for the Fifth Circuit felt disposed to give Layne credit for accomplishing an important advance in the art, nevertheless that court in the Van Ness case, 213 Fed. 804, in passing upon the scope and meaning of claim 13 said:

“While the Van Ness pump is closed at the top, it is not contended that the pump has an air vent such as the patented pump had and such as the El Campo pump had. One function of this air vent is to force any water or spent lubricant remaining in the casing, out of it, through an aperture in the top, by forcing air through the air vent into the casing, for the purpose of substituting clean liquid or oil.

It seems clear that the Van Ness pump had no such member with a corresponding function as the air vent of the patented pump or that of the El Campo pump, and so cannot be said to infringe claim 13. This, if correct, would prevent complainant from relying upon claim 13 in this case, as a ground of recovery."

In considering claims 9 and 20 the same court said:

"Giving claim 20 this interpretation, it seems that it is substantially like claim 9, except in the omission of the element of jointure or extensibility of the shaft sections, which adds nothing to the novelty and patentability of the device; and that the element common to each claim, viz., *the protective or closed casing surrounding the pump shaft from the pump to the top of the well and entirely closing off the water in the well from the shaft and its bearings, is the only element in any one of the claims as to which there is persuasive evidence in the record both as to patentability and infringement.* The word 'closed' in claim 9 seems to mean as much as the words 'entirely closed' in claim 20. (Italics ours.)

---

**MISUSE BY PLAINTIFF OF DETACHED PHRASES FROM THE  
VAN NESS AND GETTY CASES.**

The plaintiff in its argument seeks to predicate conflict between the Fifth and Ninth Circuits and endeavors to make it appear that the Fifth Circuit held the Layne patent to be of a fundamental, generic character and entitled to a broad range of equivalents, *although not infringed by the Getty device*; whilst the Ninth Circuit, still construing the

patent as valid, held it not infringed by the Western device; and yet Getty was nearer to Layne than Western.

The plaintiff always as a premise to its arguments repeats this phrase over and over again: "The Layne patent . . . did accomplish a revolution in the well-drilling industry," while failing to give the full quotation (262 Fed. 141, 143), which is:

*"The Layne patent too nearly resembles the Crannell patent to be called a pioneer patent, though it did accomplish a revolution in the well-drilling industry."*

The phrase emphasized is what the plaintiff takes occasion each time to omit. The plaintiff has also failed to call attention to the sentence or two following in the Getty case where the court said:

*"While the substitution of mere mechanical equivalents for the means adopted by Layne could not avoid infringement of his patent, it is also true that the range of equivalents cannot be enlarged upon the idea that his patent was a pioneer one in the pump art. Its advance over Crannell prevented Crannell from being considered by us an anticipation, and was enough to show novelty, but it stops there. The Layne patent must rest, not upon the idea of closure, which would not be patentable apart from the method by which it was accomplished, but upon the means of its accomplishment, as disclosed by the specifications of his patent."* (Italics ours.)

Plaintiff, likewise, ignores this, from the Van Ness decision:

"It seems quite clear that the idea of a protected casing for a pump shaft without restrictive interpretation would contain no novelty and would not be patentable, and, if this element in the patent is given the unrestricted meaning that its language admits of, it would destroy the claim."

*Van Ness*

and that in the ~~Getty~~ case the court said:

"it seems that the question of infringement, like that of novelty, is a close one" (R. 809).

And

"Layne's method of lubrication was to put the oil in at the top and to permit it to descend to each of the bearings, and remain stagnant within the shaft casing until ejected from the top after it had become spent by air pressure through an air vent . . . On the other hand, the oil was confined at the bottom of the well by use of a packing or stuffing box. Getty adopted a circulatory system of lubrication. By it the oil was also introduced from the top, and descended to the lower bearings by gravity. However, at the bottom there was only a partial obstruction to its exist, presented by a long sleeve bearing. Its passage out from the shaft casing was automatic and continuous, so that there was a constant and free flow of lubricant from the top of the line shaft, throughout its length, and out through its bottom."

We thus see that even conceding all of the contentions of Layne as to the revolutionary character of his alleged invention and the filling of a

long felt want, the court was unable to find infringement of any of his claims by a structure which did not effect a *complete closure* of the shaft-enclosing casing, but which on the contrary used a *circulatory method* of lubrication as distinguished from Layne's *stagnant system*. Although there was considerably more prior art before the Circuit Court of Appeals for the Ninth Circuit in the present case than there was before the Circuit Court of Appeals for the Fifth Circuit in the two cases referred to ante, nevertheless the former resolved all doubts in favor of Layne and sustained his patent, but necessarily found non-infringement thereof.

---

**LAYNE PATENT FOUND TO BE OF NARROW SCOPE BY TWO  
DIFFERENT COURTS OF APPEAL.**

The Layne patent, while uniformly held valid by the courts, has likewise been uniformly held as being for a *narrow* invention.

In the El Campo case only claim 13 was infringed; in the Van Ness case claims 9 and 20 were infringed because the "thrust collar" at the bottom acted as a "stuffing box" to "entirely close" the shaft tubing; while in the Getty, Los Angeles and Western Well cases there was no infringement, because they all lacked closure in Layne's sense and operated on a "circulatory" system of lubrication while Layne's system is "stagnant".

The Circuit Court of Appeals for the Fifth Circuit in the case of Layne vs. Getty, 262 Fed. 142, said:

“The Layne patent must rest, not upon the idea of closure, which would not be patentable apart from the method by which it was accomplished, but upon the means of its accomplishment, as disclosed by the specifications of his patent.”

Similarly, the Circuit Court of Appeals for the Ninth Circuit in its decision in the case now brought here for review, said (R. 1131):

“We have placed some emphasis upon the fact that all the claims in this patent relate to one principal operative invention of a well mechanism, and in that relation they all in a more or less direct and practical way were designed to co-operate and supplement each other to the common intent and purpose of being employed in an operating pump apparatus for a driven or artesian well; but when we turn to the analysis of the claims in suit, we find that the essential elements claimed to have been infringed are limited and narrow and relate only to the combinations of a rotary pump with an actuating shaft entirely closed off from the water in the well by the casing surrounding the pump shaft.”

---

**DECISIONS OF FIFTH AND NINTH CIRCUITS ARE IN COMPLETE HARMONY AS TO VALIDITY OF LAYNE PATENT.**

The same court which found infringement in two cases, but of different claims in each case, found non-infringement in a third and later case where

a different structure was involved and at a time when the court had acquired greater familiarity with the scope and meaning of the Layne patent.

The Circuit Court of Appeals for the Ninth Circuit in the instant cause, with the records of all prior suits before it, found validity and non-infringement in harmony with the findings of the Fifth Circuit of the Court of Appeals. This is clearly shown by the following quotation from the opinion of the court, *Western Well Works vs. Layne & Bowler Corporation*, 276 Fed. 470, 472 (R. 1133):

“In *Getty vs. Layne* (C. C. A.) 262 Fed. 141, the court followed its decisions in the previous cases, determining the question of the validity of the patent in favor of the plaintiff, but the court held that the patent was not entitled to the wide range of equivalents of a pioneer patent.”

That this is a correct statement we have only to note the following from the Circuit Court of Appeals for the Fifth Circuit in the *Getty* case, 262 Fed. 143:

“The Layne patent too nearly resembles the Crannell patent to be called a pioneer. . . . Its advance over Crannell prevented Crannell from being considered by us an anticipation, and was *enough to show novelty, but it stops there.*” (Italics ours.)

The Ninth Circuit in the case under consideration gives its stamp of approval to validity of the Layne patent where it is said (R. 1136):



"We are of the opinion that there is invention in the entirely closed casing of the Layne patent as claimed in claims 9, 13 and 20, particularly claim 20, functioning as it does in complete protection to the line shaft from the ingress of water and sand and in protecting the means for lubrication."

When we come to analyze the prior decisions in detail, we will see that each court in imparting validity to the Layne patent, by resolving all doubts in favor of Layne and not invalidating the particular claims sued on, did so with regard to the mechanism disclosed in the drawings and specification of the patent in recognition of well recognized principles of patent law.

---

**HOLDING OF NON-INFRINGEMENT BY FIFTH AND NINTH  
CIRCUITS ALSO IN HARMONY.**

The Court of Appeals for the Fifth Circuit, in finding non-infringement in the case of Getty vs. Layne, supra, said, at page 144, after describing Layne's method of lubrication already quoted supra,

"We think Getty has accomplished closure and lubrication by means so functionally different from Layne's disclosure in his patent that they cannot be said to be mere mechanical equivalents, but rather distinct methods of attaining the same object; the object itself not being patentable."

The Circuit Court of Appeals for the Ninth Circuit in finding non-infringement in the instant case quoted verbatim the above language (page 143)

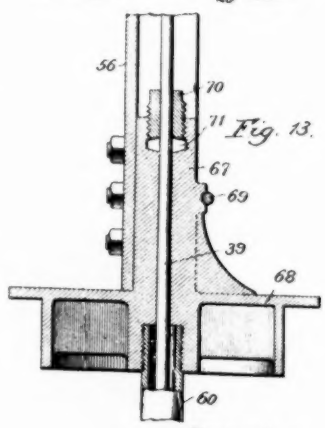
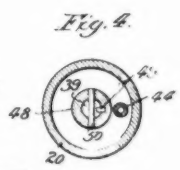
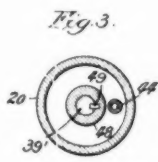
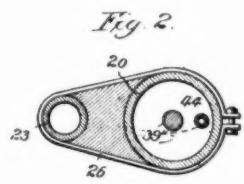
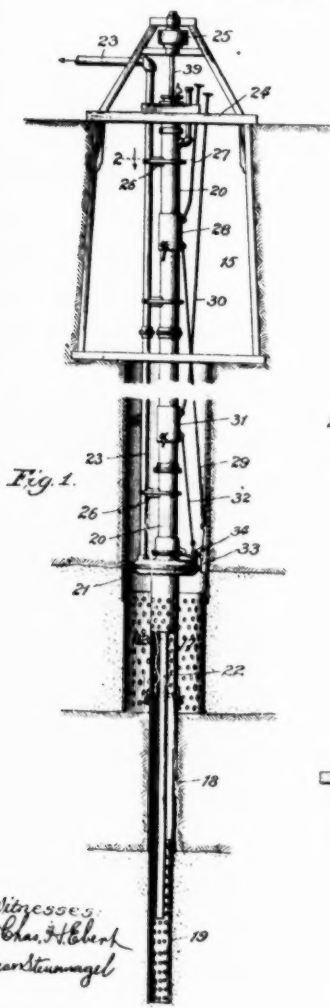
No. 821,653.

PATENTED MAY 29, 1906.

M. E. LAYNE.  
WELL MECHANISM.

APPLICATION FILED APR. 28, 1903.

4 SHEETS—SHEET 1



Witnesses:  
Chas. H. Albert  
Oscar Steinhilber

Inventor:  
Morton E. Layne  
By Paul Symonds

No. 821,653.

PATENTED MAY 29, 1906.

M. E. LAYNE.  
WELL MECHANISM.  
APPLICATION FILED APR. 29, 1903.

4 SHEETS-SHEET 2.

Fig. 5.

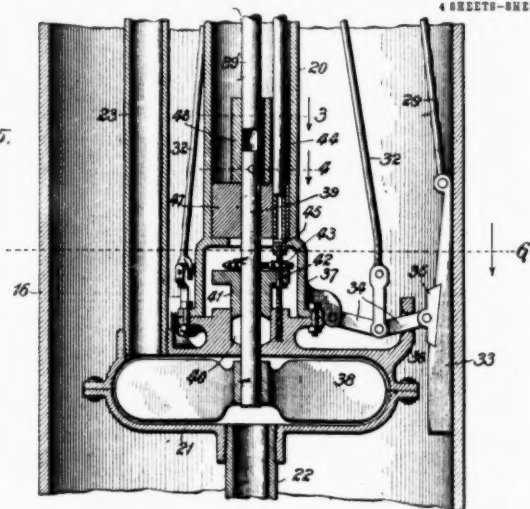
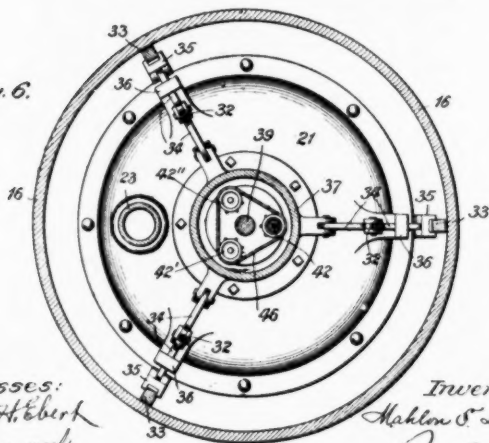


Fig. 6.

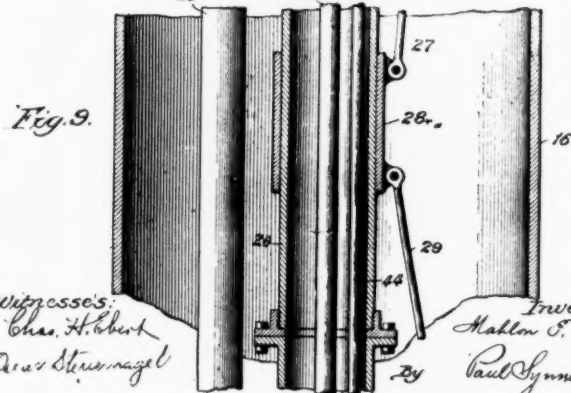
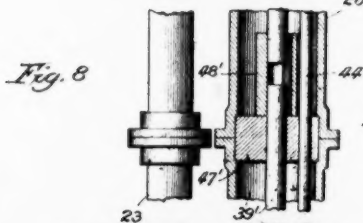
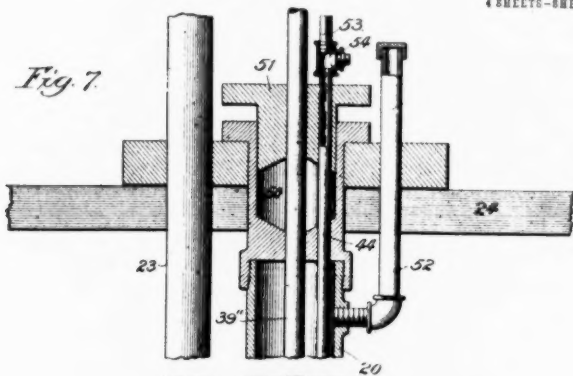


Witnesses:  
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Att'y.

M. E. LAYNE.  
WELL MECHANISM.  
APPLICATION FILED APR. 28, 1903.

4 SHEETS-SHEET 3



Witnesses:  
Chas. H. Albert  
Oscar Sternmagerl

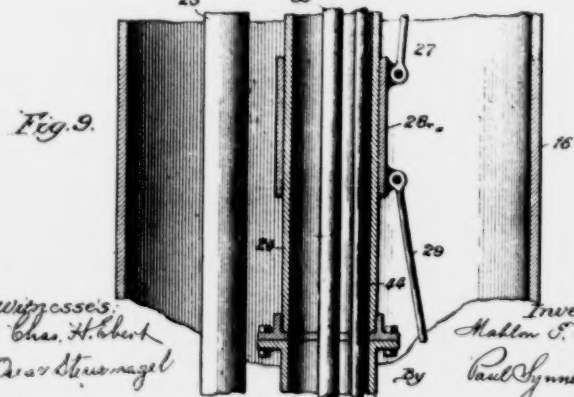
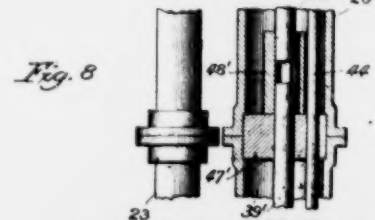
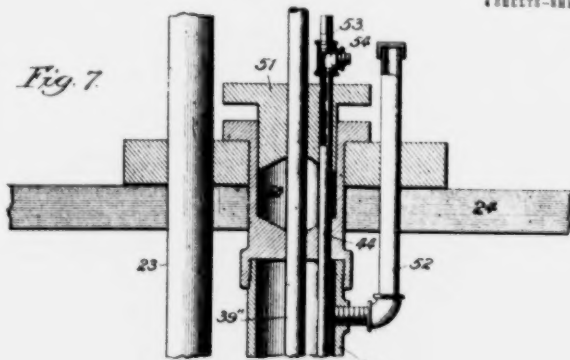
Inventor:  
Maklon F. Layne  
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No. 821,653

PATENTED MAY 29, 1906.

M. E. LAYNE.  
WELL MECHANISM.  
APPLICATION FILED APR. 29, 1903.

4 SHEETS—SHEET 3



Witnesses:  
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No. 821,653.

PATENTED MAY 29, 1906.

M. E. LAYNE.  
WELL MECHANISM.  
APPLICATION FILED APR. 29, 1903.

4 SHEETS—SHEET 4

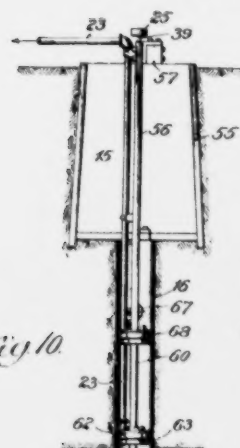


Fig. 10

Fig. 11

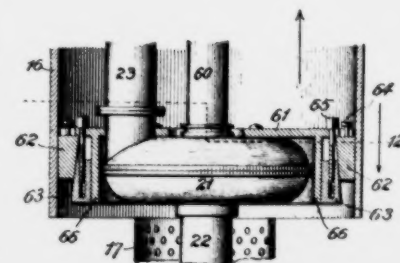
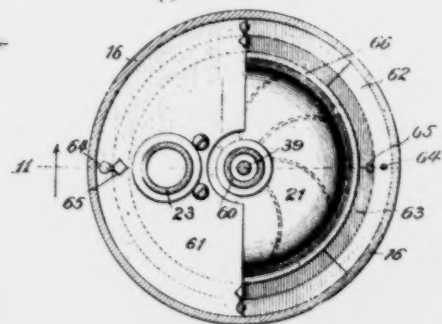


Fig. 12



Witnesses:  
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Oscar Stuenkel

Inventor:  
Mallon S. Layne  
By Paul Synnestrict  
Att'y



from the opinion in the Getty case (see R. 1135) and concluded (R. 1136):

“The difference between the Layne patent and the Getty mechanism, as it appears in Getty vs. Layne, *supra*, is essentially the difference between the Layne patent and the defendants’ mechanism in this case.”

The question brought before this court for determination appears to be whether or not the two Circuit Courts of Appeal referred to have placed a proper interpretation upon the scope of Layne’s patent and that this is to be decided not upon the extent of alleged “commercial success” attained by plaintiff in *later years on a greatly changed structure*, but upon a study of the *patent* in suit and the proceedings in the Patent Office leading up to the granting thereof, together with a consideration of the prior art.

---

THE LAYNE INVENTION AS DISCLOSED IN THE PATENT  
IN SUIT.

On the opposite page the Layne patent drawings are reproduced direct from the patent, and in connection therewith the court’s attention is invited to a consideration of defendant’s model Exhibit “B” of the Layne patent in suit, which is admitted to be correct (R. 728).

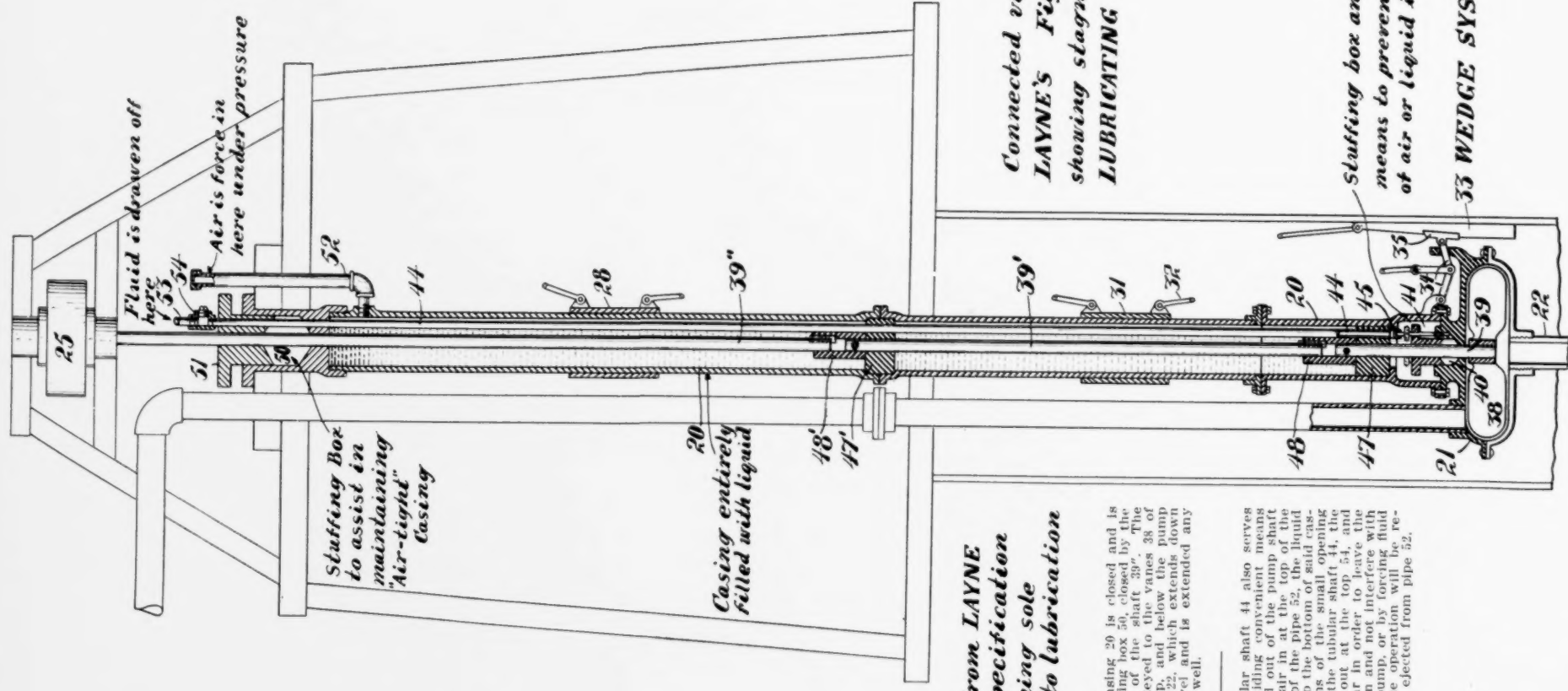
The patent in suit says:

“My invention relates to apparatus used for drawing water from driven or artesian wells, and particularly to *means for adjusting a pump therein.*” (*Italics ours.*)

Said "adjusting" means, as will be apparent from a reading of the patent, are a system of wedges indicated generally at 33 in Fig. 5 and at 62, Fig. 11 of the drawings. The stated objects of the Layne invention are:

- "(1) to provide means by which the piping and the pump may be all assembled in proper shape before inserting it into the well;
- (2) to provide means by which a pump may be placed in any desired position in a well, centered, raised or lowered and fixed in position by manipulating from the outside entirely;
- (3) to provide means for adjusting the length of the piping leading from the pump to the surface at will and to lower the pump from time to time without taking it out of the well;
- (4) to provide improved means for centering and fixing the pump in proper position in the well casing;
- (5) to provide improved means for manipulating the packing of the pump shaft, and proper adjustment of the pump in place by means at the surface of the ground;
- (6) to provide for the proper action of a pump without stopping up the well, so that water may be either flowed into or pumped out of the same at pleasure;
- (7) to provide a superior mounting for a centrifugal pump in the well, manipulated from the surface of the ground;
- (8) to provide an extensible pump shaft separately supported at intervals along its length;
- (9) to provide an automatic centering device for the pump in the well;





**Extract from LAYNE  
Patent specification  
containing sole  
reference to lubrication**

At the top, the casing 39 is closed and is provided with a stuffing box 50 closed by the cap 51, at the top of the shaft 39. The shaft 39 is fixedly keyed to the vanes 38 of the centrifugal pump, and below the pump casing 21 is a pipe 22, which extends down below the water level and is extended any desired depth in the well.

This pipe or tubular shaft 44 also serves the purpose of providing a convenient means for forcing the liquid out of the pump casing. By forcing air in at the top of the casing 20, by means of the pipe 52, the liquid can be forced down to the bottom of said casing 20, and by means of the small opening 45, in the bottom of the tubular shaft 44, the fluid can be forced out at the top 54, and keep the casing clear in order to leave the bearings clean therein and not interfere with the working of the pump, or by forcing fluid in at the top 54, the operation will be reversed, and the fluid ejected from pipe 52.

**Connected view of  
LAYNE'S Figures 5, 7, 8 & 9  
showing stagnant  
LUBRICATING SYSTEM**

**Stuffing box and tightening  
means to prevent escape  
of air or liquid into pump**

**33 WEDGE SYSTEM**

- (10) to provide for mounting the pump and the shaft in a closed casing which is open to operate from the top;
- (11) to obviate the necessity of making large wells for descending into them in order to arrange the pump, and
- (12) to generally improve and cheapen the apparatus used for the above purposes."

Inasmuch as the drawings of the Layne patent are of a piece-meal character and somewhat obscure, we have assembled the different views in one and on the opposite sheet will be found a connected view of Figs. 5, 7, 8 and 9, which Layne terms his "approved form".

Referring to this illustration it will be noted that the pump proper indicated at 38 is fixed in the well casing by a system of "wedges 33" which are operated from the top of the well by means of links (32-31-28) and toggles 34-35 (see Model "B"). The pump has a peripheral discharge pipe for the water and is driven by a splined and jointed shaft made up of sections 39, 39' and 39", which extend up through a casing 20. The casing is sealed at the bottom and top by stuffing boxes 40 and 51 respectively and is completely filled with liquid, which may incidentally serve as a lubricant. This liquid remains stagnant in the tube or casing 20 and can only be forced out through the pipe 44 by pressure of air introduced through the pipe 52. (Cut opposite)

The second form of the Layne well mechanism is shown on the ~~opposite~~ <sup>next</sup> sheet, being the same as

Layne's Fig. 10 except that the structure is sectionalized throughout, whereas the Layne patent drawings show the same not in section.

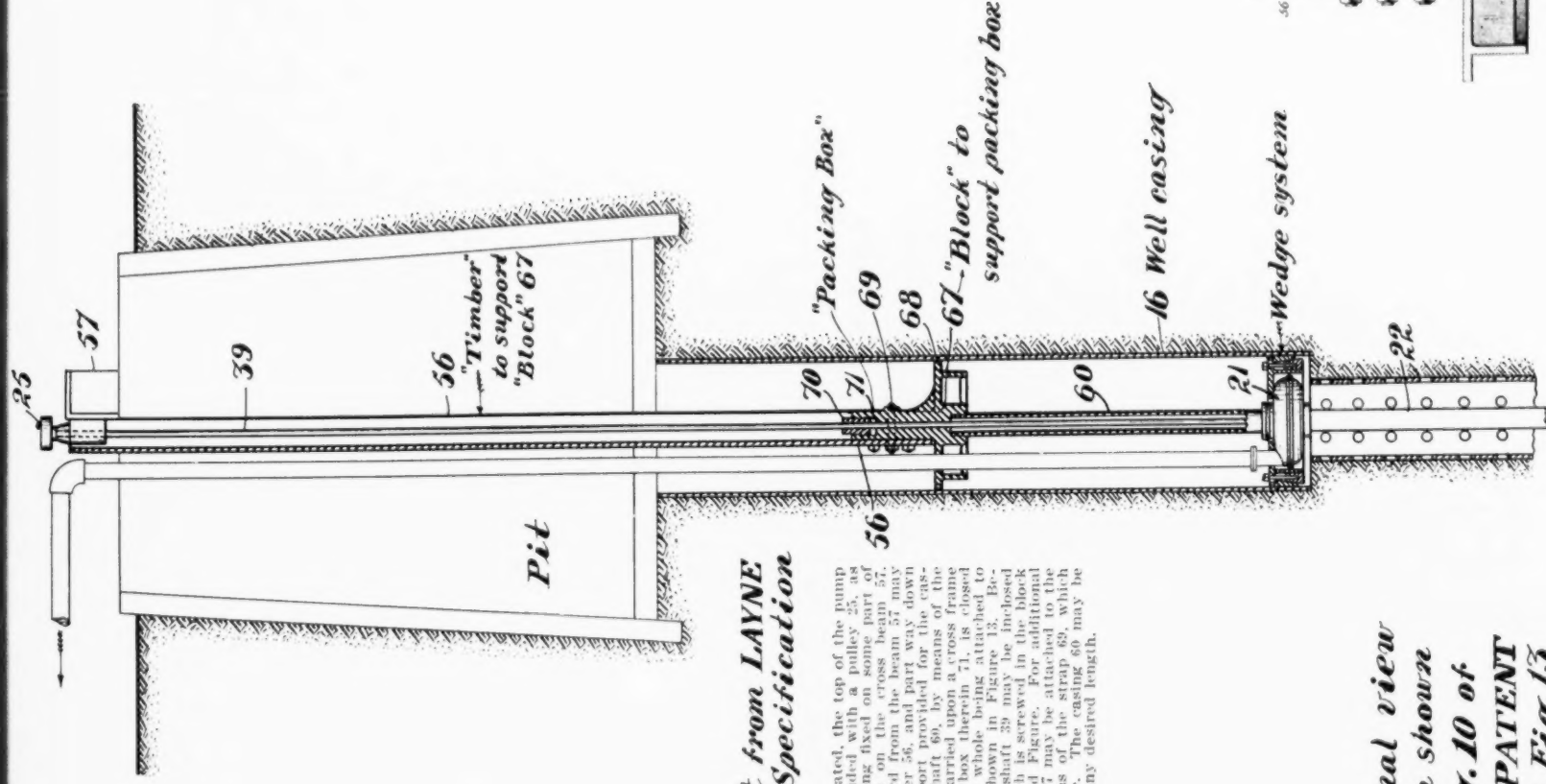
In this modified form the drive shaft is not made up of sections. It is exposed throughout the greater portion of its length. The tube "60" which extends only between the pump bowl 21 and "block 67" neither contains nor shows any lubricating means. To prevent well water rising above the pump bowl and getting up around the exposed shaft, the pump bowl 21 itself is surrounded and *packed by a water-tight "wedge system"* which prevents water from rising there-around from the well below. No lubrication whatever has been provided for in this form of the Layne mechanism.

---

Prof. Lesley, an eminent, practical engineer of Stanford University and expert for defendant, says, in expounding the Layne patent as embodied in the model Exhibit "B" beginning R. 729:

"The model shows a pump bowl, a shaft surrounded by an enclosing casing, a discharge column, and a representation of a pump head; the shaft and its enclosing casing are in sections, the weight of each section of shafting is borne by a thrust bearing; . . .

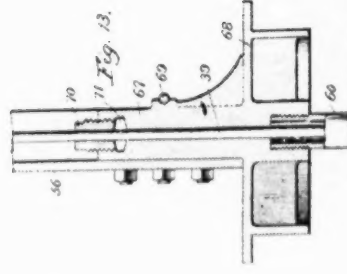
"The thrust bearings or support collars are numbered 48; the shaft-enclosing casing sections are numbered 20. In operation the pump would [691] be driven through a sectional line shaft from the top, turning the impeller, which is numbered 38, and by centrifugal force driving



# *Extract from LAYNE Patent Specification*

15 In the case illustrated, the top of the pump shaft may be provided with a pulley 25, as before, and a bearing fixed on some part of the casing 60, as on the cross beam 57. Extending downward from the pulley 25, there may be provided a timber 56, and part way down a bearing and support provided for the casing of the pump shaft 60, by means of the block 67, which is carried upon a cross frame 68; and a packing box therein 71, is closed by a screw 70, the whole being attached to the timber 56 as shown in Figure 13. Below this point the shaft 39 may be inclosed in a casing 60, which is screwed in the block 67, as shown in said Figure 13. An additional security the block 67 may be attached to the timber 56, by means of the strap 69, which surrounds the same. The casing 60 may be in sections and of any desired length.

*Sectional view  
of form shown  
in Fig. 10 of  
LAYNE PATENT  
also of Fig. 13*



*Inventor  
M. L. Layne  
Patented*

the water up the discharge column, No. 23, and delivering it to the surface of the ground."

Continuing, Prof. Lesley says:

"A lubricating feature is provided, in that the shaft-enclosing casing is made substantially tight against the entrance of water from the well or from the bowls No. 21, against the entrance of water from any point—water or anything that the water might carry with it; means are provided for tightening this tube, substantially sealing it off, both at the bottom and at the top. A stuffing-box,\* on which I find no number, is provided at the bottom; packing is arranged at the bottom. The stuffing-box is also provided with a top, and in conjunction means is provided for tightening the glands of the stuffing-box, which, of course, cannot be reached from the surface of the ground; that is the tube No. 44, which has at its lower end a sprocket which engages—a sprocket of which there are three, carrying a sprocket chain—the design appearing to be if this tube is rotating, all three stuffing-box bolts would be turned down and tightened at the same time; the stuffing-box gland at the top is the ordinary form with only two bolts. As disclosed in the patent drawings, there is a pipe No. 52 which is described as an air vent; the part marked No. 44 is also a tube, and is provided with a hole into the chamber 47."

---

\*Stuffing box: In mach., a contrivance for securing a steam-air—or water-tight joint when it is required to pass a movable rod out of a vessel or into it. It consists of a close box cast round the hole through which the rod passes, in which is laid, around the rod and in contact with it, a quantity of hemp or india-rubber packing. This packing is lubricated with oily matter, and a ring is then placed on the top of it and pressed down by screws, so as to squeeze the packing into every crevice. The stuffing-box is used in steam-engines, in pumps, on the shaft of a screw steamer where it passes through the stern, etc.

Prof. Lesley then indicates (R. 730) the *stagnant* system of lubrication employed in Layne, saying (R. 730):

"It is stated in the patent specifications *that this whole interior of the shaft casing may be filled with oil; no water can leak into it; there is no other place for the oil to leak out.* It is sealed against water at the bottom, it is sealed against oil leaking out; the lubricant may be used for such time as is necessary, until it shall have become spent [692] or worn out, and then that air pressure may be applied to the air pipe, 52, and the oil forced down and into the hole in pipe 44 and upward and out one of the openings that are provided at the top, or that the operation may be reversed, and air may be forced in at the top, thus forcing the oil upward and out of the pipe 52." (Italics ours.)

And on page 731:

"As to the lubricating feature, this pump provides what may be termed a stagnant system of lubrication; the lubricant introduced by some means into the tube is held there until it becomes spent. There appears no way by which it can be continuously fed. *It is simply held as lubricant might be in the crank case of an automobile; it is filled up [693] and it wears out or is burned out, dissipated.*" (Italics ours.)

The loosely connected sectional feature of Layne's driving shaft with *thrust collars* for supporting the *shaft sections individually* act as a further seal to enhance the stagnant feature of the Layne oiling system, and *prevent "gravity" feed.*

LAYNE IS AN UNDERNEATH FORCE FEED SYSTEM.

1. The bearing blocks or thrust collars 48 for each shaft section form a *complete seal* over the bearing on which it rests, to prevent oil passing down just as did the thrust collar in Van Ness, resting upon the long brass bushing and forming a mechanical closure (see *post* herein, page 71). In Layne each thrust collar or thrust being 48-48' would form a seal against any downward circulation of oil, even if pressure were applied, because the more pressure at the top the tighter would the thrust collars 48 of Layne seat on the bearing blocks.

2. Lubrication in Layne must be from the *bottom up*; i. e., oil must be injected under pressure through the pipe 44 (Fig. 5), passing downward and finding its outlet below the lowermost bearing, and then as the pressure of the oil piles up there below (being prevented from escaping into the well by the lower stuffing box 40-41) it would work *upward* around the shaft 39, slightly lifting the shaft and the thrust collar 48 and gradually filling the compartment in the shaft tubing above; similarly passing *upward* around each shaft section and its thrust collar until the whole reservoir or chamber formed by the shaft-tubing was filled to the top; the air vent 52 allowing the displaced air to escape as the oil rises.

The foregoing analysis explodes the "gravity feed" theory of plaintiff and shows better than any-

thing else the "stagnant" quality of Layne's lubrication.

---

**WEDGE MECHANISM FOR CENTERING THE LAYNE  
MECHANISM.**

Concerning this feature, which we find to be an emphasized one in the Layne patent, Prof. Lesley says (R. 731):

"Auxiliary devices, in the form of a wedge mechanism, parts No. 33, with sliding collars, 31 and 28 and connecting rods and toggle links, are provided, as stated by the patent, to secure this mechanism within the well. The weight of the pump bowls, and of the runner, and of the shafting is supported by the shaft-enclosing casing sections, 20, in this particular model, which I should say is substantially correct with the drawings; the weight of the discharge casing, or discharge tube, 23, is also supported by the tube line."

Now if we turn to the patent we see how these features so tersely described by Prof. Lesley are emphasized by the patentee.

---

**"THE WEDGES."**

Thus on page 2 of the patent (R. 1003) beginning line 1, the patentee says:

"In order to previously assemble all the parts and then put the pump into the well and fix it in position therein, I provide a system of wedges 33, which serve to fix the pump in place and hold it in the proper vertical position, designed to be operated by means from the top of the



well, avoiding the necessity of a man's going into the well in order to fix the pump in place."

And lines 28-35, page 2:

"Thus in order to obtain greater power and fix the wedges more securely in place, it will be observed that by pulling up on the rod 32, the toggle links 34 will cause the wedge blocks 35 to press with great power against the wedges 33, and thus fix the pump casing in place wherever desired."

And again lines 105-111:

"The wedge system illustrated for tightening the pump casing in place may also, if desired, be used to *center it* with respect to the casing. The outlet pipe 23 is also preferably made in sections to correspond with the sections of the pump shaft casing." (Italics ours.)

And again lines 120-124 (R. 1003):

"A series of co-operating wedges 62 may also be provided, suspended from the platform 61 by means of the screws 64, and the two series of wedges surround the whole casing."

And again page 3 (R. 1004):

"It will be seen also that the toggle levers used for actuating the wedges may be used or not, as desired, since the wedges alone will be amply sufficient in the apparatus of Figure 1, as well as in that of Figure 10."

---

#### WEDGES ABANDONED.

As showing how impractical this "wedge system" is and that no part of the commercial success of

the plaintiff-appellee's pump can be attributed to this feature of the invention, see Mr. Layne's testimony on cross-examination (R. 594):

"XQ. For instance, taking Figure 5, the wedges, 33, which contact with the well casing, 16: Have you ever used those?

"A. At the time of my invention——

"XQ. Just answer 'Yes' or 'No.'

"A. We have not used a pump that would go in the bore of a well. . . .

"XQ. Please answer 'Yes' or 'No.' Have you used those wedges, 33, for the function specified in the patent, or at all?

"A. We have never used the wedges."

And as to the means for operating the wedges Mr. Layne testifies (R. 594):

"XQ. Have you ever used the toggle numbers, 34 and 35, which connect with those wedges?

"A. No, sir.

"XQ. Have you ever used the parts represented by the rods or links, 32, which connect with the toggles?

"A. No, sir."

And (R. 595):

"XQ. And, referring to Figure 1, have you ever used the sliding sleeves, 28, 31, for manipulating those respective links, 32, 29?

"A. They all refer to the wedges, which we have not used. [578]

"XQ. And, likewise, you have not used the stem members, above 27 and 30, to connect with those sleeves?

"A. We have not."

The importance of the functions to be performed by the wedges is repeatedly emphasized in the pre-

amble to the patent (R. 1002), where Layne says among his various objects are:

"to provide means by which a pump may be *placed in any desired position in a well, centered, raised or lowered and fixed in position* by manipulating from the outside entirely." . . . (Italics ours.)

And:

"to provide improved means for *centering and fixing* the pump in proper position in the well casing."

Again Layne says, lines 25-27:

"to provide improved means for manipulating the packing of the pump shaft."

This refers, of course, to the key rod 44, chain and sprockets 42, and the lower packing gland or stuffing box 41.

Again Layne says (beginning line 32, page 1):

"to provide a superior mounting for a centrifugal pump in the well, manipulated from the surface."

That agains refers to the toggles and links, sprockets and chains above mentioned.

The importance of the wedges is again emphasized in the preamble (line 37)

"to provide an *automatic centering device* for the pump in the well."

Layne admits, *supra*, that none of these centering and positioning adjustments have ever been put into use.

*These features form no part of the defendants' structure.*

---

**FUNCTION OF LOWER STUFFING BOX OR PACKING  
GLAND 41.**

The patentee having repeatedly stated that the form of Fig. 1 is the preferred form bears down on the importance of the pump shaft casing being closed both at top and bottom "to form an *air-tight chamber*" and "water kept out of the casing 20" (see page 3 (R. 1004), beginning with line 74):

"I consider it of great advantage also to arrange the pump shaft in a closed casing with stuffing box at surface of ground at top of pump, so that by the use of the packing boxes an air-tight chamber can be maintained, and water kept out of the casing 20, or kept filled with clean liquid, if desired, thereby providing an efficient lubricating system for all bearings of the pump."

The patentee repeatedly emphasizes that "the casing 20 is closed" and emphasizes the necessity and functions of the "stuffing box 50" and "the packing box 40." Thus on page 2 of the patent (R. 1003) line 58:

"At the top, the casing 20 is *closed* and is provided with a *stuffing* box 50, *closed* by the cap 51, at the top of the shaft 39." (Italics ours.)

And lines 66-72:

"The casing 20 also contains a tubular rod 44, which has a bearing in the block 47 on top of

is provided with a square opening which co-operates with the head of the screw 42, used for adjusting the cap 41 of the *packing box 40* for the pump, and compressing the packing in place."

---

**PACKING BOXES ABANDONED.**

This bottom "stuffing box 40" *has never been used* commercially by Layne (R. 595) where he testifies:

"XQ. Likewise, referring to Figure 5, have you used the stuffing box, 41?"

"A. No, sir, we never have in that particular form. We have used a brass or metal sleeve there, thorough lubricated, which performs the same function.

"XQ. Then your answer to my question is you never used the stuffing box, 41?"

"A. No, sir."

The lubricated "metal sleeves" referred to by witness does *not*, as the appellate court quite properly held in the Getty case, perform the function of the stuffing box 41.

(Note: It is not to be overlooked that the stuffing box 41 is shown in the patent *in addition* to the bearing below it. If it were not for the stuffing box, the oil in the tube would be sucked out around the bearing, due to the suction in the pump case. For that reason the patentee put in the stuffing box 41 to keep in the oil and to exclude the water. By so doing Layne brings about a condition made essential in claim 20 where he says: "a line shaft for the pump entirely closed off from the water in the well.")

The patentee next explains how this lower packing box is to be operated from the surface, or, as he says in the preamble, page 1 of the patent, lines 26-27:

“to provide improved means for manipulating the packing of the pump shaft . . . by means at the surface of the ground.”

He describes these means beginning with line 3, page 2 of the patent (R. 1003):

“In order that this cap 41 may be raised and lowered evenly, the screw 42 is provided with a sprocket wheel, and two other screws of a similar kind are distributed about the cap, as shown in Figure 6, and connected by means of the sprocket chain 46, so that by means of the tubular shaft 44, all three of said screws 42 may be turned at once to compress the packing in box 40.”

*Defendants do not use and never have used any “stuffing boxes” nor their equivalent.*

The attempt of one of plaintiff's experts to find equivalency between the lower “stuffing box” of the plaintiff and the open “drain tubes” or *anti-stuffing boxes* of defendants would be amusing if it were not for the fact that it seems to have been put forward under the cloak of sincerity.

---

**THIS LOWER PACKING BOX AN ESSENTIAL ELEMENT OF  
THE LAYNE PATENTED STRUCTURE.**

It was by means of this lower packing box of Layne whereby he might effectually exclude water

from the well, or as Layne says in his patent (p. 3, lines 77-82—R. 1004):

. . . “that by the use of the packing boxes an *air-tight* chamber can be maintained, and *water kept* out of the casing 20” (*italics ours*),

that Layne differentiated, if at all, from the prior art, in so far as “an enclosed line shaft” was concerned.

---

#### STUFFING BOXES ANOTHER ABANDONED FEATURE.

This adjustment means “for manipulating the packing of the pump shaft . . . from the surface” has never been used commercially, it being utterly impractical (R. 594). See R. 595, where Layne testifies:

“XQ. And you have never used the adjusting mechanism shown by the sprocket chain, 46, and the sprocket, 42, 42', 42", shown in Figure 6 of the patent?

“A. All being parts of the packing gland, we never have used it.”

---

#### EVACUATING THE OIL.

The means (pipe 44) for tightening the lower packing to make the same air-tight and water-tight performs also the function of evacuating the spent oil in the shaft enclosing tubing or oil reservoir. Thus says the patentee page 2 (R. 1003) beginning with line 83:

“This pipe or tubular shaft 44 also serves the purpose of providing convenient means for forcing the liquid out of the pump shaft cas-

ing. By forcing air in at the top of the casing 20, by means of the pipe 52, the liquid can be forced down to the bottom of said casing 20, and by means of the small opening 45, in the bottom of the tubular shaft 44, the fluid can be forced out at the top 54, and keep the casing clear in order to leave the bearings clean therein and not interfere with the working of the pump, or by forcing fluid in at the top 54, the operation will be reversed, and the fluid ejected from pipe 52."

---

**THIS OIL-EVACUATING MEANS ABANDONED.**

The pipe 44 with its double function of adjustment for the lower packing and for evacuating by air the oil reservoir enclosed by the casing 20, together with the vent pipe 52, has never been used commercially, being likewise utterly impractical, although undoubtedly novel with the patentee (R. 595) where Layne testifies:

"XQ. And you have never used the pipe, 44, which is shown in Figure 5, down to the bottom of the shaft tubing?

"A. No, sir, we never have."

The "air vent" of the patent is the short pipe 52 (see Fig. 7).

*Defendants have never used any of these devices.*

Layne's sectional shaft and bearing blocks 48 to carry the shaft sections are commercially impractical and never used. The patentee on page 2 of his patent (R. 1003) concerning the sectional,



extensible feature with slip joint arrangement of his shaft says, beginning lines 50-57:

"The weight of the shaft and pump below the block 47 is carried by the block 48; and from Figure 8 it will be seen that a similar arrangement is made at the top of the next section of the shaft casing, where the block 47' supports the weight of the section of shaft 39' by means of the collar 48', connected by a pin and key as before."

This feature is again emphasized on the same page, lines 97-104:

"It will be noticed that the weight of the pump and its shaft is supported at each end of the sections of the casing by the blocks 47, 47', etc. By reason of this arrangement the pump shaft and the shaft casing can be made in separable sections, and consequently the pump may be inserted at any desired depth and the parts assembled before putting them into the well."

*Defendants have never used the loose sectional construction of shaft nor the bearing blocks.*

*Moreover, this is another abandoned and impractical feature of Layne.*

(See Layne's testimony (R. 597) ):

"XQ. Now, referring further to the same drawing, have you ever used the sectional shaft, 39 and 39', with loose sliding connections at their abutting end? In other words, spline the shaft and giving the sections a limited movement with relation to one another?

"A. In our construction we have used in one or two instances a method of that kind, but

our general practice is to use the screw and flat coupling."

And R. 598 and 599:

"XQ. Such a loose coupling method would not permit of suspending the impeller from the top, would it?

"A. No, sir. That was intended for deep lifts, where the proposition was supposed to have been carried in different loads.

"XQ. Consequently, this method of impeller suspension and the shaft coupling have never been put into use by you?

"A. Only in a few instances.

"XQ. It never has become your commercial product?

"A. No, sir.

"XQ. You have never used the thrust collars, then, 48 and 48', have you?

"A. Not for thrust purposes, but for the shaft bearing purposes we have used them exclusively.

"XQ. You have used a single thrust collar, like 48, in Figure 5, at the bottom of your pump structure?

"A. We have never used the thrust collars in the two, only in very few instances; we have only used the collars connecting the shaft by thread methods.

"XQ. And you have done away with the use of the thrust collars, 48, that we see working on the bearings?

"A. So far as contracting the bearings, we have never used that as a commercial product, containing the bearings for thrust purposes."

*Defendants have never used any of these abandoned features nor any equivalent therefor.*

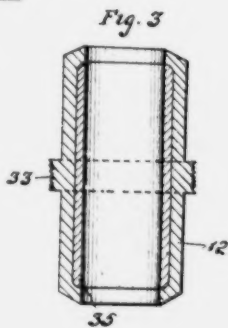
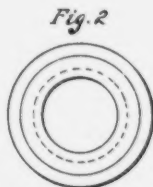
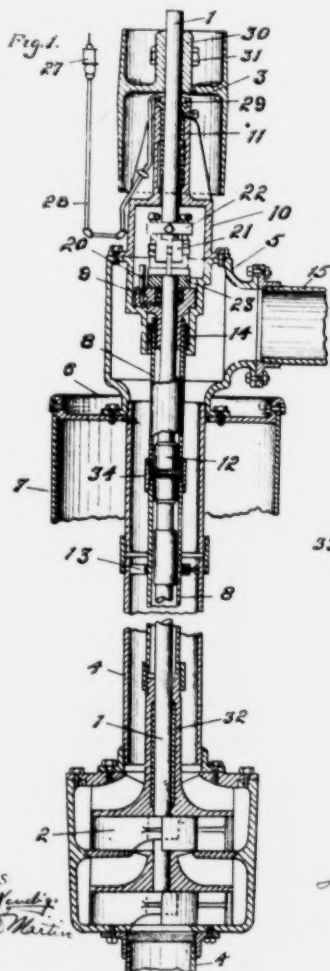
M. E. LAYNE.  
WELL MECHANISM.

APPLICATION FILED MAY 17, 1912.

Reissued Sept. 24, 1912.

13,467.

2 SHEETS-SHEET 1.



WITNESSES

*John H. Smith*  
*Archibald Martin*

*M. E. Layne* INVENTOR.

BY

*Paul Synnestvedt*  
ATTORNEY.



**THE ABANDONED FEATURES.**

Layne's structure, stripped of the abandoned features above, leaves a skeleton differentiated with difficulty, if at all, from the prior art.

---

**LAYNE'S COMMERCIAL PUMP BUILT UNDER A  
SUBSEQUENT PATENT.**

It is quite proper to point out that the actual Layne commercial structure introduced in evidence by plaintiff as Exhibit 8, but not explained, and claimed to be its present commercial pump, is *not* made according to the patent in suit, but is made under the later Layne Reissue patent No. 13,467, dated September 24th, 1912, (see cut on opposite page). This patent was identified (R. 587-8) as being one of the patents under which the commercial pump is marked as patented. Claim 12 thereof reads as follows:

"12. In combination, a pump, a drive shaft therefor, a series of bearings for the shaft, a shaft casing inclosing the shaft and supporting the bearings and preventing access of the fluid while being pumped to such shaft and bearings, and a discharge casing inclosing the shaft casing whereby the fluid from the pump is carried upward in contact with the exterior of the shaft casing."

If we were to substitute this reissue for the patent in suit we might see some possible basis for the claim of "commercial success" and for the trial court's view as to what constituted the Layne "concept."

## THE LAYNE FILE WRAPPER.

(*Defendants' Exhibit "D," R. 957.*)

The Layne file wrapper is here referred to in connection with the limitations imposed upon the Layne patent by the actions in the Patent Office and as showing what Layne and his attorney considered Layne's "dominant idea" in securing his patent. It was the *combined feature* of a *shaft enclosing casing*, wherein its bearings "are," to quote applicant's attorney, "*completely closed off from the water in the well*" with "the line shaft supported at various points in the various sections" and with means for supporting the pump "at any desired point in the well." The court in the Van Ness and Getty cases has pointed out that this latter feature of the adjustable support in the well means the complicated and discarded system of wedges.

Several patents were cited against Layne, but the only ones to which we need to call attention is the Crannell patent in evidence as defendants' Exhibit "G," *supra*. The Eisler patent, *post*, which is here in evidence, was apparently overlooked by the Patent Office. The fact that Eisler was not cited weakens rather than strengthens the presumption that accompanies the issuance of a patent in favor of its validity. (*American Co. vs. Sample*, 130 Fed. 145, 149 (C. C. A. 3rd Circuit).)

The Layne patent application was filed April 28th, 1903. That is the very earliest date, as we will see, that Layne can claim as his invention.

As originally filed the application contained twenty-four claims, all of which, except six, were rejected. Although this rejection was on June 2d, 1903, no reply was filed thereto until January 30th, 1904, and considerably subsequent to the issuance of the Alvord patents and what is significant, it was subsequent to the Pabst installation of the Byron Jackson encased line shaft pump at Milwaukee.

---

**LAYNE'S AMENDMENT OF JANUARY 30th, 1904.**

In this amendment of January 30th, 1904, Layne amended his application, filing several new claims including 'present claim 20 in controversy, but did not accompany this amendment with any Supplemental Oath. It is to be presumed as a matter of law that Layne and his attorney had meanwhile become acquainted with the Alvord patents which had issued during the year 1903, and applied for before Layne's application, and had noted that Alvord showed a shaft tubing but that this shaft tubing was not "entirely closed off from the water in the well," but had openings in it through which water could pass. These Alvord patents being public documents, Layne and his attorney were charged with notice of them and of their contents.

Again, in view of the correspondence passing between the Byron Jackson Iron Works and the Peden Iron & Steel Co., evidenced by the letter introduced by plaintiff herein (R. 873), and in view of certain other correspondence between the parties

which plaintiff did not see fit to introduce, and, in view of Mr. Bowler's naive letter of November 13th, 1911, to "Friend Layne" (R.870), it is reasonably inferred that Layne had wind of the Pabst installation where there was an enclosed line shaft primarily designed *to close off the shaft bearings from the water in the well.*

There was in the Pabst case the very intent and purpose of *closing off the water in the well from the oil in the shaft casing*, as far as practically possible and by means substantially identical with defendants' present mode, for in Pabst, as will be pointed out, the oil passed out from the casing into the well through drawn tubes (R. 166. ) just as in defendants' case. Whatever the presumptions and inferences are, Layne's claims, and particularly claim 20, had their first concept at this time of the Pabst installation and before Layne's amendment of January 30, 1904.

The significance of the foregoing finds its parallel in the recent case of Superior Skylight Co. vs. August Kuhnla, Inc., 265 Fed. 282, 284 (quoting from Lyon Non-Skid Co. vs. Hartford, 247 Fed. 524) wherein Judge Manton said at page 536:

"A series of amendments were filed within a month in the Fageol application before the Lyon patent was issued, in an effort to secure claims broad enough to affect the Lyon patent, and in this way many, if not all, the claims in suit were inserted and radically modified. This may have been brought about by the successful and extensive use of the Lyon bumper. The court should not lend its aid to such an effort of an enterprising patentee. Lovell vs. Oriental Co., 231 Fed. 719, 146 C. C. A. 3. The Lyon con-



struction and operation was new in Lyon's work in 1911, and is covered by his patent in suit. Lyon gave his valuable invention to the public. Fageol gave a different type of rigid bar bumper which proved to be impracticable and a failure commercially. It inevitably follows that Lyon should have full credit for the success and the protection of the court.' "

To that case we might add the observations of the Court of Appeals of the 2nd circuit in *Stafford, Inc. vs. Thaddeus Davids Ink Co.*, 264 Fed. 111, 114:

"As for the rest the plain effort of plaintiff to 'lick into shape' some new claims that would read directly on what a competitor had just put out, is not attractive, and justly leads any court to scan closely claims so composed" (citing *Lyon, etc., Co. vs. Hartford*, (D. C.) 247 Fed. 524, affirmed 250 Fed. 1021, 162 C. C. A. 664).

Reverting to the File Wrapper, Layne's attorney argues in his amendment of January 30th, 1904:

"The examiner's attention is first called to the fact that in applicant's device the line shaft and all its bearings *are completely closed off* from the water in the well and that the line shaft is supported at various points in the various sections, and that either in the device of Figure 5 or in the device of Figure 10, the outlet for the water from the pump is independent of the casing which surrounds the line shaft, and in case the pump casing is sealed off completely as in Figure 10 the discharge may be through the upper end of the well casing and still the *water does not come in contact with any of the bearings or the line shaft.*" (Italics ours.)

These admissions in the Patent Office should be regarded as the expressions of a competent expert, *Sugar Co. vs. Yaryan*, 43 Fed. 140.

As further emphasizing this "entirely enclosed" feature, Layne says:

"It is not supposed that this applicant is the inventor of the broad idea of using a wedge for fixing a device at a particular point in the well casing, but only that he is the originator of the idea of operating and tightening mechanism for the pump by *means entirely enclosed in the shaft casing and not exposed* to the deleterious effect of the water being pumped through the well." (Italics ours.)

(Note: This shows another reason for "entire closure" in that the *tightening* means for the *lower gland* are *not exposed*.)

And still not to lose sight of this important feature he says further:

"In fact none of the references show a *closed driving shaft* casing which extends from the top of the well to the pump and being affixed to the pump in the well casing. These *two features* are necessarily combined because the *essential thing of the invention* is the drawing up of the water from below the pump and discharging it through an outlet which is independent from the casing enclosing the bearings, *whereby the bearings are entirely protected from the flowing water.*" (Italic ours.)

(Note: "Protection from flowing water"; not sand, but *flowing water*. Western Well is not protected from "flowing water" though it is partially protected, of course, from sand.)

*“Entirely”*: If we refer to the lexicographers to ascertain what Layne meant by the words “entirely enclosed” as used repeatedly in his arguments above, we need but refer to the Standard Dictionary, which thus defines the word “entirely”:

“without diminution, exception or qualification; wholly; completely.”

The reference Crannell is given special consideration; Layne emphasizing that Crannell “cannot be fixed at any desired point in the well” and that “the lower bearings in the (Crannell) pump are directly exposed to all the sand and detritus in the water” (so is the Western Well Works for that matter).

As to the Northam patent, which we have introduced simply to show a jointed shaft for a turbine pump, from all appearances, seems adaptable to bored wells, Layne’s attorneys argued before the Patent Office:

“It does not appear how the Northam pump can be held to show an extensible shaft inasmuch as the shaft that belongs to any one of the pumps is not extensible and the only way to extend the shaft at all is to put in a new pump. In other words each one of the pumps and its shaft is independently supported, but there is no extensibility of the shaft to any one of the pumps.”

(It would appear to be true that the Western Well Works pump, being supported as it is by the discharge column, is independent of the shaft. Each

is independently supported and our shaft is no more extensible than Northam's.)

We thus see that applicant presented as the essence of his invention the drawing up of water from below the pump and discharging it through an outlet which is *independent from the casing enclosing the bearings*, by means of a driving shaft casing 20 closed by stuffing boxes 40 and 51 and a separate and independent discharge pipe 23, together with means, such as the wedges 33, for fixing the pump within the well casing.

After various colloquies extending over a period of a couple of years, *and after the Byron Jackson unpatented pump had received wide vogue*, the Layne patent issued on May 29th, 1906.

---

#### LAYNE A MERE PAPER PATENT.

From the File Wrapper and the surrounding circumstances in connection with this application and the fact that the patented structure is uncommercial and impractical, it is apparent that the patent in suit is a mere paper patent at best and must be narrowly construed and however construed in the light of the art and of the proceedings in the Patent Office defendants' structure cannot be held to be an infringement.

Plaintiff's efforts to expand its patent beyond its true meaning recalls the case of *Detmold vs. Reeves, et al.*, 1 Fisher 127, 131, where Kane, J. took occasion to say:

"But the contract of the public is not with him who has discovered, but with him who also makes his discovery usefully known. If he has discovered much and discloses little—if there has been revealed to him one of the *arcana* of nature, and he communicates to the world only one or more of its derivative and secondary truths, he patents no more than he has proclaimed. He will not be allowed afterward, when the extent of his right shall be the subject of controversy, either by expanding into a general expression what was limited before in a particular form, or, by tracing out for us the line that leads back from consequences to remote causes, to initiate us, inferentially, into the radical mystery of his invention, and then argue that he had described it by implication from the first, and so claimed ownership of it in his patent."

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PRIOR ART.

*History of the Small Bore Deep Well Centrifugal Pumping Mechanism.*

Plaintiff would have the court believe that centrifugal pumping mechanism for deep wells of small bore was unknown prior to the date of Layne's alleged invention. With this in view plaintiff introduced a self-serving drawing of a pit pump (plaintiff's Exhibit 2) and Layne testified, but without corroboration, that this represented the general practice prior to his supposed invention. There is not only ample evidence in the record to show that small bore wells, and deep well suspended pumps were old before Layne, but to show the "pit pump" is a popular favorite and rival to both plaintiff and defendants' pumps today (R. 784-6).

British patent No. 24,430 to Mather, dated January 19th, 1895 (R. 1040) (see cut opposite) shows a deep well of small bore provided with a centrifugal or rotary pump which is operated by a shaft driven from the surface of the ground. The specification states:

“My invention relates to apparatus for pumping water from well bores so arranged that the pump can be readily adjusted in position and power to suit *greater or less* depths of bore.

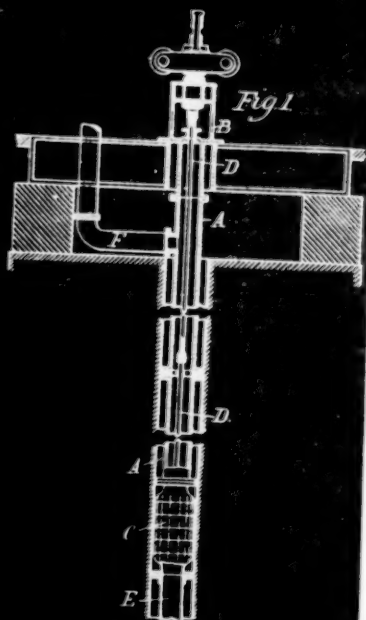
“For this purpose I extend down the bore a pipe which is the delivery pipe of the pump and in this pipe there is a spindle which is driven at the top of the well by any suitable motor, and which works a rotary pump or special construction attached to the pipe.”

British patent No. 2774 to Thomson, dated November 13th, 1860 (R. 1052) (see cut opposite) also shows a rotary or centrifugal pump which is adapted to be inserted in a deep well of small bore. It is suspended from the top of the well by the discharge casing A and is driven by a sectional shaft which is supported in bearings b, d and c. The specification states:

“Figure 3 in the accompanying Drawing shows one of my improved pumps with two revolving wheels placed in connection with each other, in such a way that the water discharged by the lower wheel passes into the suction part of the upper wheel; by this means I can raise water or other liquids *to any height* with the same speed of revolution of the wheel that would be required for half the height with one wheel; and, if necessary, three or more wheels may be placed in conjunction in a similar man-

A. C. 1894 No. 45, 460  
THOMSON & STEADMAN

MATHER (BRITISH)  
No. 54,480, Dec. 18, 1894.



OLD EXAMPLES OF PENDENT STRUCTURES FOR BORED WELLS





Patented July 29, 1902.

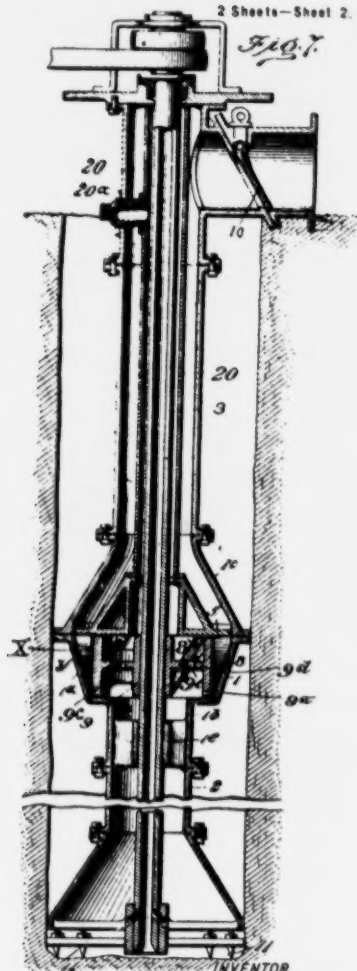
E. M. IVENS, Dec'd.

H. K. IVENS, Administrator.

PUMP MECHANISM.

Application filed Apr. 30, 1901.

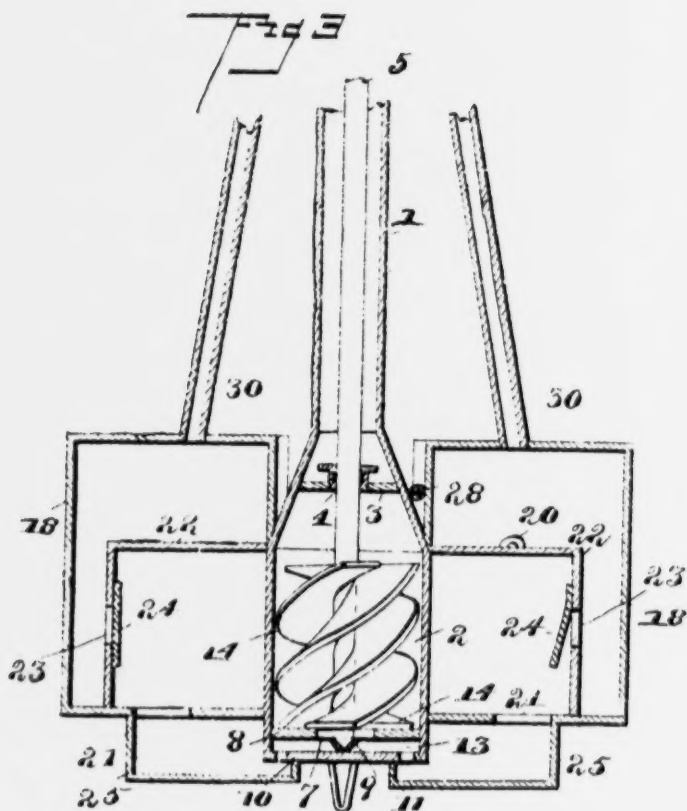
2 Sheets—Sheet 2.



INVENTOR  
Edmund M. Ivens

BY  
*And G. DeBuck & Co.*  
ATTORNEYS





CRANNELL PATENT  
Defendant's Exhibit "G," R. 1025



ner with the effect of still further reducing the necessary speed of rotation."

United States Patent No. 705,844 to Ivens, July 29th, 1902 (R. 1058) (see cut opposite) also shows a small bore deep well pumping mechanism. The specification states:

"My present invention is in the nature of an improved centrifugally-operating pumping mechanism adapted for use in *deep wells* and for lifting water from bayous and lagoons for irrigating purposes; and it comprehends, generically, a casing having a lift-pipe and a discharge-pipe connected thereto, a centrifugally-operating pump-disk held within the casing, and a specially-arranged means for passing the water through the casing in an annular and upwardly inclined direction."

It is interesting to note that Layne's patent nowhere refers to a deep well.

Plaintiff argues that these prior pendent pump structures fitted in deep wells of small bore failed to afford adequate protection to the bearings of the line shaft. Such an argument overlooks the fact that protecting casings for this purpose are old and well known in the same art (see *post*, for instance, United States patent No. 425,933 to Crannell, April 15th, 1890, and No. 522,518 to Eisler, July 3rd, 1894).

---

#### THE CRANNELL PATENT.

(*Defendants' Exhibit "G."*)

The Crannell patent, a cut of Figure 3 of which is shown on the opposite page, is described with

respect to its pertinent features by Prof. Lesley as follows (R. 184):

“Figure 3, No. 1, shows a shaft-enclosing casing; No. 2 shows what is termed in the patent a cylinder which corresponds to the pump bowl of the patent in suit, No. 21. No. 3 shows what is called a diaphragm plate forming a closure between the pump bowl and the shaft-enclosing casing. No. 4 is termed in the specification an aperture through which the shaft may pass. The specification states that the shaft is properly packed at this point, that is, at the bottom of the line shaft. No. 5 is the shaft which is surrounded by the enclosing casing, No. 1. No. 14 is the runner or impeller; in this instance it is an impeller of the screw type, not of the centrifugal type.”

Concerning Crannell the court in the Getty case said (262 Fed. 141, 143):

“The Layne patent too nearly resembles the Crannell patent to be called a pioneer patent.”

And Judge Jack in his opinion has said:

“The Crannell apparatus, which was not a commercial success, provided for a closed casing around the shaft transmitting power to a rotary pump, but did not provide intermediate bearings along the line of the shaft. This absence of intermediate bearings is practically the only difference in principle between the two mechanisms in so far as claims 9 and 20 are concerned. It is urged by the defendant that the adding of intermediate bearings to prevent the shaft from whipping does not involve invention, that it is something that would occur to anyone skilled in the art, and that, likewise, the method of oiling by letting the oil run down from bearing to bearing, would occur to anyone.

and had always been the method of oiling vertical shafts.

"The court is much impressed with this argument. The insertion of additional bearings to prevent whipping of the shaft where the distance between bearings is too great, is as simple and natural a thing to do as the putting in a fence of extra posts to prevent sagging of a barbed wire, where the posts of the panels are too far apart. Were the question a new one, *I should be inclined to hold the patent invalid*, but the same issue was raised and directly passed on by this court and by the Court of Appeals for this circuit, in the Van Ness case sustaining the patent.

"It is contended by the defendant herein that the evidence in the Van Ness case was to the effect that the Crannell pump would not work, whereas, by physical demonstration on the trial of this case, the contrary was shown, and the court therefore should not feel bound by the ruling in the Van Ness case. The opinion in the Van Ness case, however, does not appear to have been based on the evidence that the Crannell patent would not work." (Italics ours.)

If it is urged that the Crannell patent is merely a paper patent, that is met by the holding of ~~our~~ *the* Circuit Court of Appeals in Wonder Mfg. Co. vs. Block, 249 Fed. 748, 750, where Judge Gilbert said:

"It is contended, also, that the Nathan patent is without probative value, for the reason that it is but a paper patent, and that there is no evidence that the invention has ever been used. But that fact does not affect its value as evidence upon the question of infringement."

As a consequence one of the patents in that suit was held void for lack of invention over Nathan even though Nathan had not been pleaded.

**THE EISLER PATENT.**

The Eisler patent and a model of same are in evidence, respectively, as defendants' Exhibits "F" and "X"; the patent drawing being shown on the opposite page. Concerning Eisler, Prof. Lesley says (R. 185-187):

"This is a model (defendants' Exhibit 'X') of the Eisler patent as disclosed by the drawing, particularly with reference to Figures 1 and 4, and by the specifications which follow on the succeeding pages. There is provided in this structure a column construction which, as the inventor states, is supported by means of four columns, numbered here 6. To these are fastened an outer casing, No. 7, and an inner casing, which is numbered, as in the patent, No. 4. There is provided a shaft, which is suitably supported by bearings, No. 19, No. 23, 18 and 17 in the bottom. These bearings are carried upon floors Nos. 9, 10, 11 and 12, and also No. 8. These floors, as stated by the inventor, are spaced at suitable intervals around the casing to properly steady and line the shaft. The shaft is provided with vertical adjustment by means of set collars, No. 20 and 22, which may be adjusted in position, and thereby the shaft raised or lowered, and fixed in any desired position, and any vertical motion prevented; a further set collar is particularly called attention to at the bottom—over the bottom bearing—which, as the inventor says, is designed to exclude the sand. Between the inner casing, No. 4, which fits into an enclosed shaft and the outer casing, No. 7, are what are called water passages in what we would term the water discharge column, which provides for the passage of water upward as it is impelled by the runner of the pump. The water is drawn into the pump through ports in the side of the outer casing, entering the suc-



(No Model.)

S. N. EISLER.  
ROTARY PUMP.

No. 522,518.

Patented July 3, 1894.

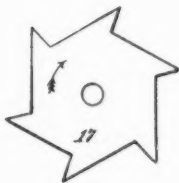
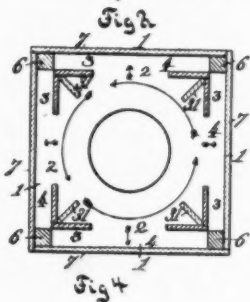
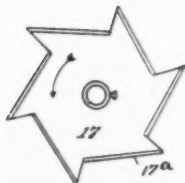
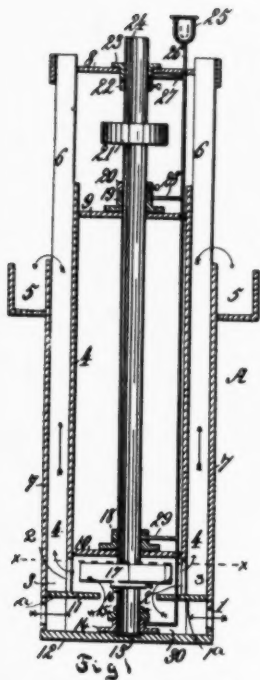
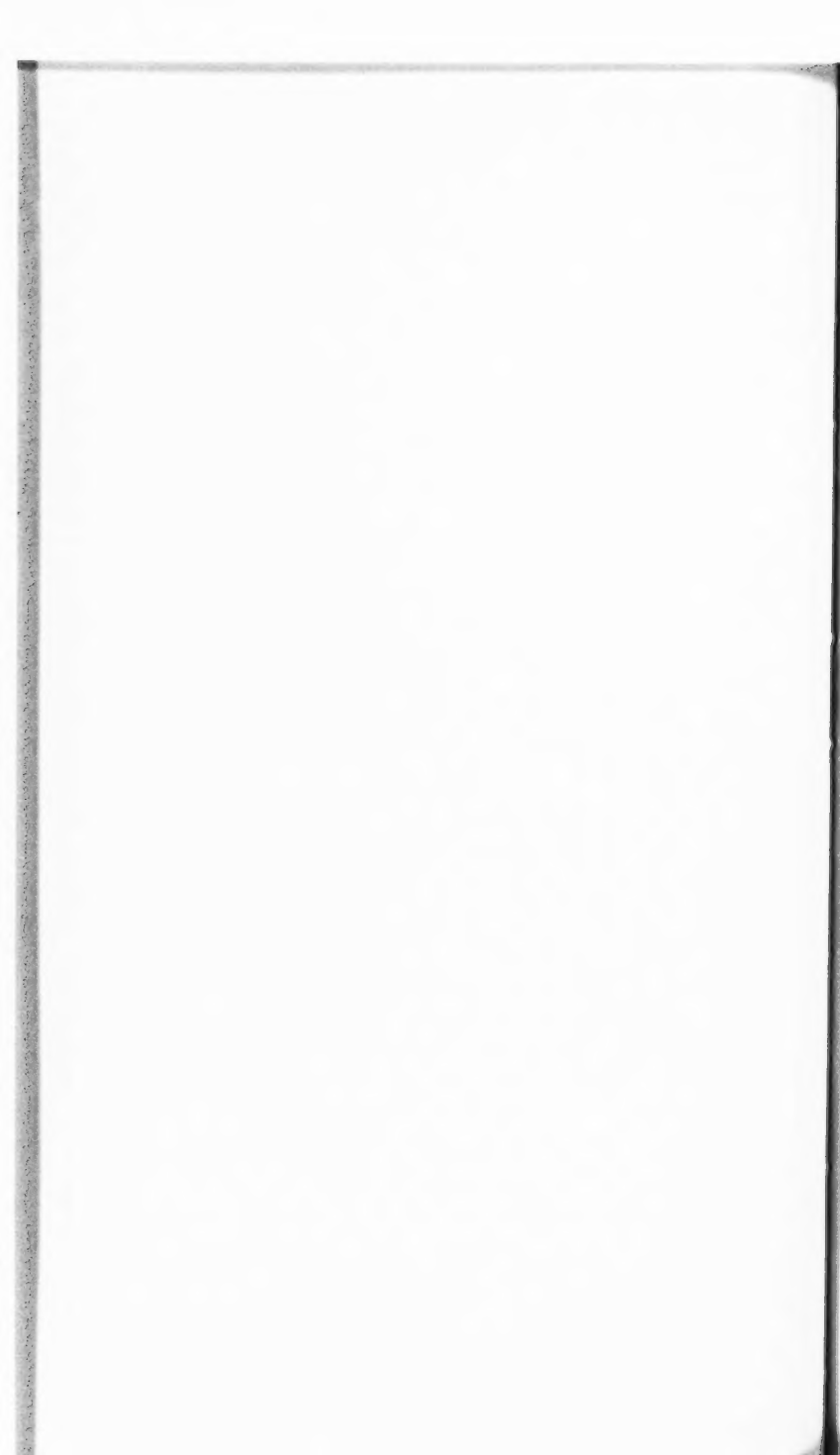


Fig. 3.

Witnesses  
*Robert E. Rice.*  
*Sidney B. Cook.*

Inventor.  
*Stephen E. Eisler.*  
By *Walter H. Cook*  
Attorney.



tion chamber just below the floor, numbered 11. It then passes upward through a central port and by the action of the impeller, which is shown here as No. 17, is forced out the port, out the bottom of the shaft-enclosing casing, into the passage which leads upward. He calls attention to the fact that this casing extends above the outer casing, so that any water that comes up these passages is spilled over here, and not into the casing around the shaft. A lubricating feature, to which he calls particular attention, is provided, a pipe not numbered in this exhibit—I believe the pipe is 26—which has branch pipes, and they are numbered 27, 28, 29, and they lead to the various bearings, even to the bottom-most bearing of the pump. There are shown in the model and in the patent drawings the intercepting plates No. 31; they are shown in section here; they extend inward radially from the corner of the shaft-enclosing casing, extended downward, and are designed to perform a similar function as that of the so-called diffusion vanes of the more modern turbine pump. The inventor states without them the water would probably circulate continuously in there. It appears that he did not know the entire theory of the turbine pump when he made this design. *There are provided in this structure three functions: exclusion of water and detritus from the shaft, and positioning and alignment of the bearings for a shaft, and in this case a means for lubrication which is not, in itself, the shaft-enclosing casing.*" (Italics ours.)

The fact that the Eisler patent may be a so-called paper patent does not prevent its being considered a good reference for everything that it discloses. (Block vs. Wonder, C. C. A., 9th Cir., 249 F. 748.)

Further than that, the Eisler patent is entitled to additional consideration by reason of the fact that it was *not cited* by the Patent Office in connection with the Layne application.

As said by the Circuit Court of Appeals for the Third Circuit in *American Soda Fountain Co. vs. Sample*, 130 Fed. 145, 149:

“We do not agree with the contention that the fact that the file wrapper discloses the patent to have been granted as first applied for, without any references, adds any force to the presumption of novelty arising from the grant. On the contrary, we think the force of that presumption is much diminished, if not destroyed, by the lack of any reference by the Examiner to, or consideration of, the ‘Clark’ patents.”

As for being entitled to claim credit for the commercial development of the small bore deep well pumping mechanism Layne is hopelessly outclassed. The testimony of Daniel W. Mead and John W. Alvord, two civil engineers of high standing, shows clearly in what manner the commercial development of this type of pumping mechanism received its start.

Mr. Mead testified at R. 41-42:

“Well, I am obliged to refresh my memory in regard to the date of a paper that was prepared by Nicholas Simin, who was a civil engineer, an engineer of the water works of Moscow, Russia. He came to this country in 1901—

. . . Mr. Simin read a paper on the water supply of Moscow, that may be seen in the Proceedings of the American Waterworks Associa-

tion, 1901, pages 33 to 41. In this paper Mr. Simin described certain centrifugal pumps which had been installed by a manufacturing concern, Farcoe, I think it is, of Paris, France, installed by this company in the Moscow waterworks for raising water from deep wells to the surface; which consisted, as I recall it, of a single centrifugal pump, driven at a high rate of speed, which was sufficient to pump the water for some considerable distance from below the surface to the surface.

"On account of the problem which was continually before my office at this time of securing quantities of water from wells of this nature, and the difficulty previously mentioned due to reciprocating machinery and its constant wear and breakage, the method used in Moscow appealed to me as of considerable interest. In that connection I wrote to the Byron Jackson Machine Works, or to Mr. Byron Jackson, who had manufactured pumps for me before, and inquired as to whether he would undertake to manufacture a pump of generally the same character as— . . . those they used in the Moscow waterworks."

(Mr. Mead's correspondence with Byron Jackson will shortly be referred to.)

Mr. Alvord likewise gives credit to the article which appeared in the proceedings of the American Waterworks Association describing the Moscow project. His testimony is as follows:

"The matter of the deep well pump was one which presented itself to my mind during the summer of 1901. There was obviously a need for better means for lifting water from deep artesian wells in Northern Illinois, and the region centering there, and there was no adequate ap-

paratus at that time which would lift large quantities of water economically from such wells. My attention was first definitely called to the possibility of such an apparatus by a paper published [351] in the American Water Works Convention in the Summer of 1901, in which an attempt at Moscow, Russia, was the subject of a paper, and there was described there certain pumps inserted in wells for this purpose. It appeared to me, from a study of this paper, that these pumps were defective and could be improved upon, and during that year I revolved the matter over considerably. In about February, 1902, I was engaged by the President of the Chicago Clearing & Transfer Co., having large property interests southwest of Chicago and outside of the city limits, beyond the reach of any ordinary water supply, to investigate and report to him on the best methods of drawing water from wells in that neighborhood. I advised Mr. H. H. Porter, the president of the company, that this was a problem which was difficult because no appliance was then on the market which would adequately do this work, and that it was obviously desirable to invent and originate some appliance for the purpose. Mr. Porter encouraged me to look into the matter further, and on or about April 8th, as disclosed by me in former testimony at a former hearing, my diary shows that I adopted a definite idea for the purpose, and a day later disclosed this same to Prof. Daniel W. Mead, Professor of Hydraulic and Sanitary Engineering of University of Madison, Wisconsin. Sometime between the 8th of April and the 14th, I made certain sketches in a note-book in which I was recording investigations at Clearing for such a device. The first— There are three sketches in this note-book, and the first two of them I identify as being between the 8th and

the 14th of April, 1902, because on the second page of the note-book I find the date reading as follows: 'From Mr. Shire April 7, 1902.' Mr. Shire being the [352] Chief Engineer of the Chicago Clearing & Transfer Co. at that time. On the page following the second sketch I find an entry reading as follows : 'From Lawrence Machine Company April 17, 1902.' The first of these sketches shows a horizontal section of a deep well with an *inclosed shaft* in the center, the shaft being 1 inch in diameter, the tube surrounding and inclosing the shaft being  $1\frac{7}{8}$  inches outside diameter, and the well being  $5\frac{3}{4}$  inches internal diameter. The apparent purpose of this drawing was to compute the area available for the flow of water after inclosing a shaft in the center of the well. The second sketch, two pages following in the same note-book, shows two vertical sections of a shaft and its *inclosed casing*. The section on the left shows the shaft with a coupling, an *inclosed casing* with the coupling, a bearing upon which the shaft revolves, and a screw device by which such *inclosed shaft* and casing can be adjusted so as to be vertical within a well whose walls are not exactly vertical. The drawing on the right also shows a vertical shaft, an inclosed casing with a shaft coupling, a casing coupling with interior screw coupling, and a wooden bearing upon which the shaft revolves."

The sketches referred to by Mr. Alvord are in evidence as defendants' Exhibit A-4. Mr. Alvord is the patentee of United States Patents Nos. 735,690, 735,691 and 735,692 of August 11th, 1903, to which reference will be made later.

In all of Mr. Alvord's patents he refers to the fact that he is dealing with pumps for *deep wells*, 100 feet or more in depth, and in each of *his patents* he shows a *protecting casing* for the drive shaft.

**LAYNE'S CONCEPTION ALLEGED TO HAVE OCCURRED IN LATE  
SUMMER OF 1902 BUT NOT PROVEN.**

Layne at this time was working in the rice fields of Texas and perhaps was also familiar with the Moscow project. The earliest date claimed by Layne for conception of his alleged invention was the late summer of 1902, and as to this the showing is woefully weak. No drawings, models nor sketches are offered to substantiate this date. Layne's sole corroboration is a witness by the name of Woodburn who testified at R. 861-62 concerning an alleged conversation with Layne and some "pencil marks on the side of the building" made at the time.

Strong suspicion attaches to this testimony for the reason that Woodburn recalled nothing whatever about the wedge system which makes up 90% of the Layne patent and he attributes functions to the shaft enclosing casing which are not specified in the patent.

There is nothing in the record showing activity on Layne's part from the time of the alleged barn-door sketch of 1902 until he filed his application on April 28th, 1903.

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**LAYNE IS LIMITED TO APRIL 28th, 1903 (His Filing Date)  
AS HIS DATE OF INVENTION.**

Woodburn seeks to fix the conversation taking place in 1902 by a recently discovered memorandum book whose character and existence and custody remain unexplained.



\$100,000.00

PATENTED AUG 11, 1908

No. 778,698

PATENTED APR. 11 1903

J. W. ALVORD

WIM SPIED ROYAL PRINCE

40000-04

0-68017-900-0 \$19.95

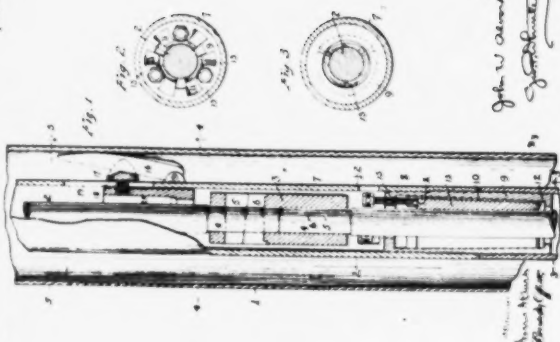
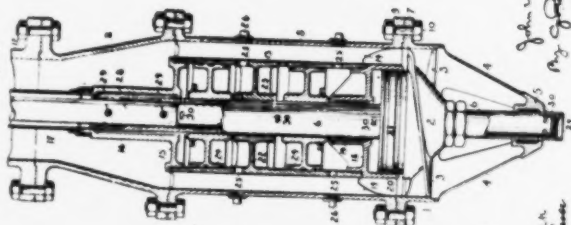
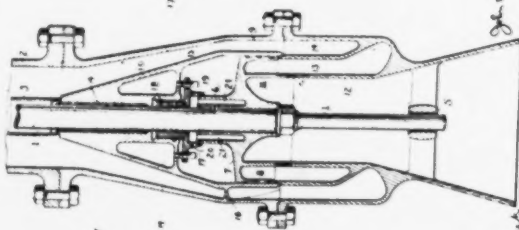
No. 778463

PATENTED AUG 11 1908

J W A 7 7 2

MEANS FOR ALIGNING YOUR CHATLINE WITH CARPUS

**• DE MORA**

[illegible]

James H. Hays  
Richard H. Hays

John W. Adams  
to Godfrey

John W. Alvord  
J. W. Alvord



"Where the date of use of an alleged anticipating device is shown beyond doubt, the burden rests on a subsequent patentee to carry his invention back to an earlier date, and for that purpose oral testimony alone is not sufficient."

National Machine Corp. Inc. v. Benthall Machine Co., 241 Fed. 72.

See also the observations of Mr. Justice Bradley in *Atlantic Works v. Brady*, 107 U. S. 102, 27 L. Ed. 440:

"Interested as he is in the result of the suit, his own testimony cannot be allowed to prevail against a course of conduct so utterly at variance with it. It may be true; but we cannot give it effect against what he himself did, and did not do, without disregarding the ordinary laws that govern human conduct. . . . Sufficient appears, however, notwithstanding the evidence adduced to the contrary, consisting mostly of the testimony of the complainant himself, to convince us that Brady derived his whole idea from the suggestions of General McAlester;" . . .

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### Re: Alvord Patents.

#### ALVORD PRIOR INVENTIONS.

The deposition of Mr. Alvord, of Chicago, Illinois, is in evidence on the question of *prior invention*. (The court, of course, will not confuse this defense with that of "anticipation" and "prior publication".) Certified copies of the file histories of Alvord's three patents (see opposite page), are in evidence, not for the purpose of showing "anticipation" or "prior publication," but "prior in-

vention". The grant of a patent raises a presumption that the patentee was the original inventor of the thing patented and the invention was made at the time the application was filed, and one claiming priority of invention has the burden of proving, by evidence which is clear and certain, that the invention was conceived and reduced to practice by another prior to the date of application. (Consolidated Ry. Electric Lighting & Equipment Co. v. Adams & Westlake Co., 161 Fed. 343, C. C. A. 7th Circuit.)

The dates of application of the several Alvord patents are as follows:

Filed Nov. 17, 1902—No. 735,690—Issued Aug. 11, 1903 (R. 930).

Filed Dec. 24, 1902—No. 735,691—Issued Aug. 11, 1903 (R. 935).

Filed Mar. 30, 1903—No. 735,692—Issued Aug. 11, 1903 (R. 944).

The "shaft casing" of the first patent (see opposite page) is number 7 in the drawings; the patent saying (p. 1, lines 54-63):

"The shaft is inclosed in a shaft-tube 7, made in suitable lengths coupled together and considerably less in diameter than the well-casing, so as to leave an annular space 8 between them for the water to flow up through. At suitable points in the tube are bearings for the shaft, consisting preferably, of a bushing 9, rigidly secured in the tube, as by the screw-threads shown, and slightly tapered internally."

Moreover, practically *all the claims of Alvord, feature "a tube inclosing said shaft"* (claims 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12). Thus claim 7 for example:

"7. The combination with a well-casing, of a rotary pump-shaft therein, a tube inclosing said shaft, bearings in said tube, braces hinged to said tube, and means for locking said braces."

This patent (No. 735,690) has to do with the very thing Layne lays such great store on in his patent: "enclosure," "bearings in the tube," and "alignment."

The second Alvord patent has the protective shaft tubing 17.

In the third Alvord patent the shaft inclosing tube is numbered 3; the patentee saying (p. 2, lines 4-6):

"The rotatable pump-shaft 1 passes down through the uptake or delivery-pipe 2, being preferably inclosed in a casing 3."

The Alvord defense takes on added interest in this suit over and against anything appearing in the prior litigation where Alvord was relied on to show *anticipation*; for as Mr. Alvord testified (R. 377):

"On the 2d of February, 1920, Mr. J. B. Harmon, whose card left with me shows him to have been sales engineer of the Layne & Bowler Co. with headquarters at Memphis, Tenn., called at my office and took up the matter of my patents in connection with his own company's operation. Mr. Harmon represented that, in his

opinion, Messrs. Layne & Bowler were developing their ideas in the Patent Office on or about the time when I was at work similarly in developing my ideas. Mr. Harmon inquired what I would expect to receive for my patents in the matter and I named him a price of \$5,000. Thereupon he asked me if I would give him a short option on that amount, and I gave him a thirty-day option for the purchase of the patents. Mr. Harmon represented to me that those patents would be quite valuable to his company; that they were doing a large business in the sale of these pumps, amounting, as he said, to some \$3,000,000 per year, and that the rice industry could not have been promoted without the use of the pumps in question and the improvements which they and I had made. He further stated that if the Layne & Bowler Co. should own my patents they could undoubtedly collect royalty from other companies who were using the same, and that he could recommend to Mr. Layne promptly the purchase of my three patents. Whereupon I had written out my proposition in writing, signed it and gave it to him on that date."

The letter referred to is in evidence as defendants' Exhibit "A12" and set out in the record at R. 655 reads:

"In accordance with our conversation this afternoon, I would propose to sell the Layne & Bowler Company all right, title and interest which I have in the patents relating to deep well pump shaft alignment and other related contrivances with reference to vertical centrifugal pump equipment, all for the sum of \$5000 cash, with the understanding that these patents be used by your company, being known as the Alvord patents numbered as per Patent Office; and the further understanding that this proposition is accepted within thirty days from the

date of your offer. I will further support said patents by competent testimony in court, if called upon to do so, at the rate of \$100 per day and necessary expenses."

This interview and letter of Mr. Harmon (occurring *after* defendant's notice of taking testimony) taken in connection with Harmon's interference with the witness, Classman, and the reluctance of these men to testify, particularly Alvord (R. 305-351 inc.), until the option expired March 2, 1920, and which ordinarily would have carried defendants' time beyond Rule 47) seem to point their own moral.

Layne's patent, both as to anticipation and as to the presence of invention, must be judged upon the basis of *prior knowledge and invention* of which Alvord's applications are a part.

Concrete Appliance Co. v. Mienken et al., 267

Fed. 958 (C. C. A., 6th Cir.);

Lemley v. Dobbins, 243 Fed. 391.

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#### THE BYRON JACKSON DEFENSE.

The Byron Jackson defense and the circumstances leading up to the Pabst installation are important in two things:

- (1) As illustrating the problem of arranging for oil lubrication of a shaft in a well and at the same time keeping the oil from getting into the well; and
- (2) its bearing on the question of infringement.

Unquestionably if the Layne patent is to be interpreted as broadly covering any kind of a line shaft with a tube around it to protect the bearings from sand and to afford a means of lubricating the shaft bearings and without any restriction on the escape of the oil from the tube into the water in the well, then the Byron Jackson invention becomes important in determining the matter of priority. On the other hand, giving the interpretation to the Layne patent that every court before which it has come, has given it by making the lower stuffing box an essential of the Layne closure means to provide an "air tight" chamber and prevent contamination of the water by the oil, the Byron Jackson testimony still remains important and pertinent as showing as Judge Morrow pointed out, *non-infringement* by these defendants.

Byron Jackson, it is to be remembered, was at the time of Layne's alleged invention a recognized authority of national reputation and a large manufacturer of pumping machinery. The evidence of his thought and accomplishments along this line of deep well pumping is shown by the depositions of Frank H. Jackson, H. C. Robb and Daniel W. Mead; the latter a distinguished engineer and Professor of Hydraulic Engineering in the University of Wisconsin; also by the correspondence passing between Byron Jackson and his company on the one hand and Mr. Mead and the Pabst Brewing Company on the other.



The purpose for which this testimony was offered originally was to show *priority of invention* and *priority of knowledge* of the encased line shaft problem, although it is true that Byron Jackson never used "stuffing boxes" in his installations or other means to keep in the lubricant, because he says in a letter to Prof. Mead dated June 30th, 1903 (R. 132):

"I know of no method of retaining the oil in the bearings and all of the waste oil is there to pass into the water pumped."

And as late as September 5th, 1903, he writes:

... "I make no guarantee regarding oil injuring the water or making it in any way unsuitable for the use of the Pabst Brewing Company."

(See Judge Morrow's opinion, R. 1146.)

If the court holds as all the other courts have done that Layne's invention therefore differs from Jackson in the interposition of the lower stuffing box 40-41 of the Layne patent to make an air-tight oil-tight chamber and the use of mechanical oil evacuating means, as the tube 44 and vent 52, wherein and whereby Layne solved the problem of closure where Jackson failed, then the Jackson defense has served its purpose in the manner indicated in Judge Morrow's opinion (R. 1142-1148, inclusive).

Concerning the testimony on the subject, it is to be pointed out that the depositions of Jackson and Robb appear by stipulation of counsel on file, being

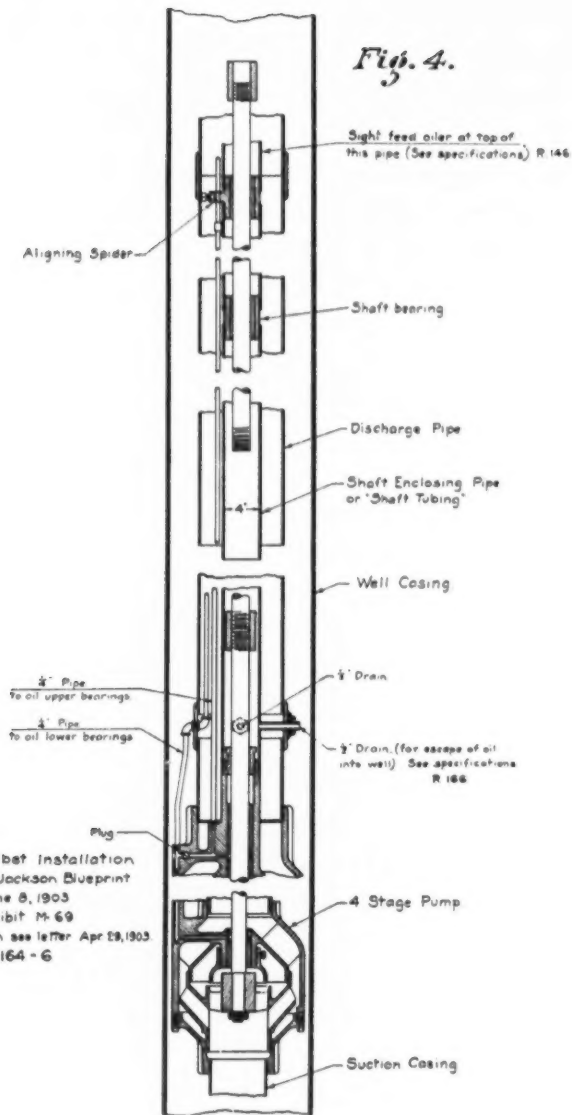
the same depositions made by these gentlemen in the Los Angeles suit. The deposition of Mr. Mead was taken simultaneously with the taking of his deposition in the Los Angeles suit simply as a matter of convenience and entitling the deposition in the respective causes. There is no privity, nor has there been at any time any privity between the present defendants, or any of them, and any of the defendants in the Los Angeles suit, or other litigation respecting this patent. It has merely happened that in the Los Angeles suit, due to conditions of the Court Calendar and the practice in the Southern District, that that case came on for hearing and decision first. As a matter of fact, the present suit was filed before the Los Angeles suit was filed. Under the circumstances your Honors are to view this Byron Jackson knowledge as a defense entirely new in the litigation over the Layne patent.

The correspondence passing between Byron Jackson, Professor Mead and the Pabst Brewing Company, supplemented by numerous working drawings, is represented by defendants' Exhibits "M-1" to "M-91", inclusive. The development of the encased line shaft therein is illustrated by the series of drawings opposite.

For Byron Jackson's description of drawing No. 1 see his letter to Mead, dated March 31st, 1902 (R. 63) Exhibit M-5.

For Byron Jackson's description of drawing No. 2 see same letter, Jackson to Mead (R. 62) where he says:

*Fig. 4.*



Actual Pabst Installation  
Per Byron Jackson Blueprint

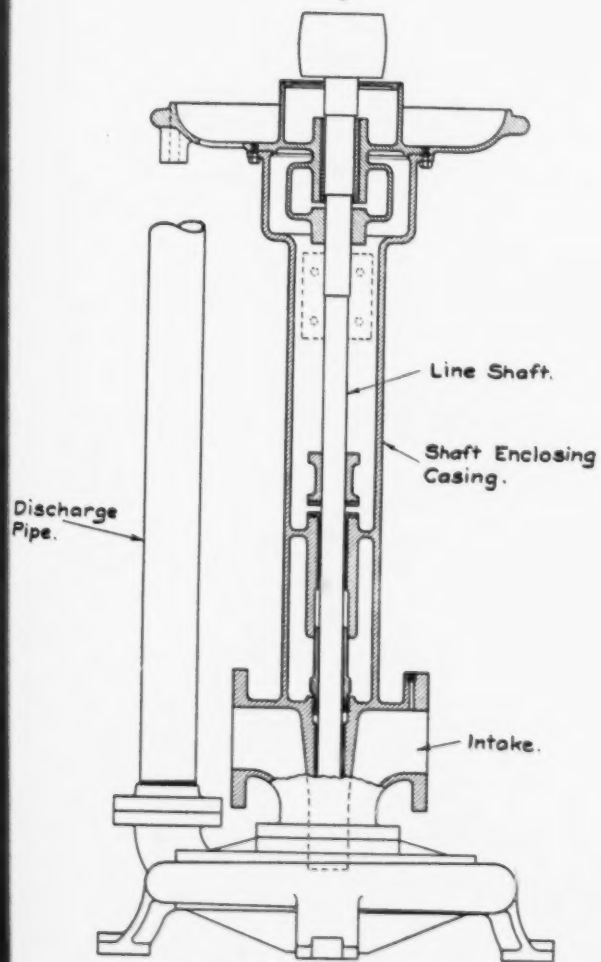
June 8, 1903

Exhibit M-69

For description see letter Apr 29, 1903

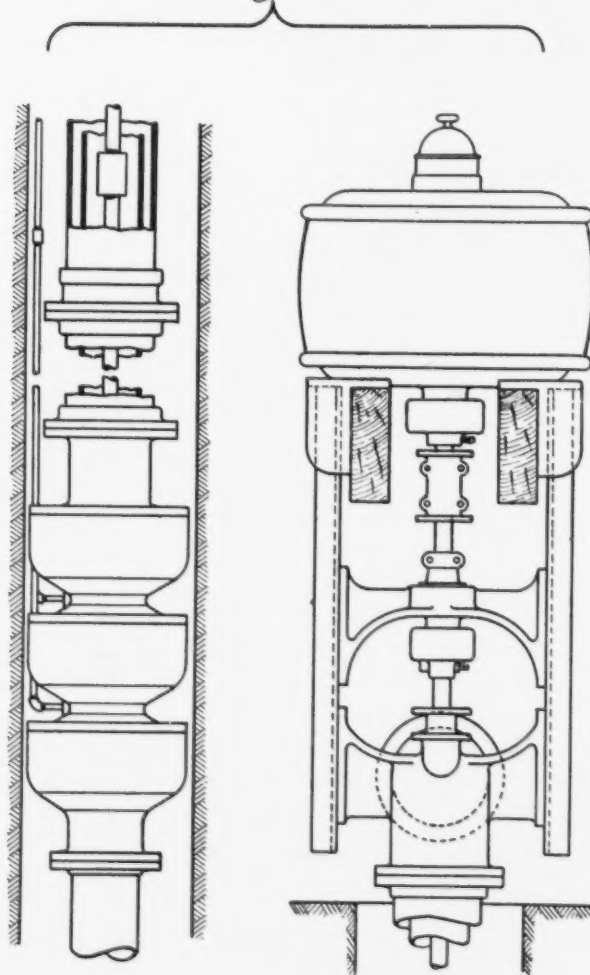
R 164 - 6

*Fig. 1.*



BYRON JACKSON DRAWING.  
R. 1114 AND R. 649.  
MAY 8, 1901.

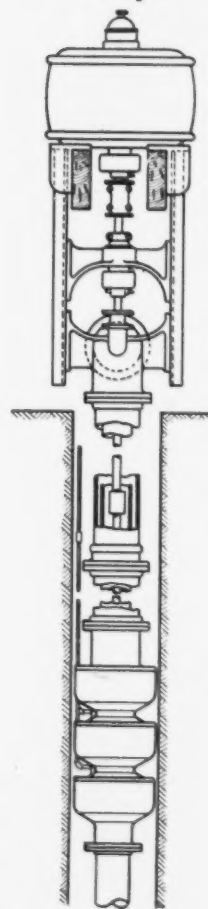
*Fig. 2.*



BYRON JACKSON DRAWING N° 1-C-75  
EXHIBIT M6-R74-1063  
MARCH 5, 1902.

*Fig. 3.*

Assembled view  
of Fig 2





"I herewith inclose an illustration of a small 3 series pump on base, that will give you some idea of it, but of course it will not give you any idea of size."

For Professor Mead's description of drawing No. 2 opposite (drawing No. 3 being an assembly of the two views of No. 2) see R. 72 where he says that the same consists of a

"series centrifugal pumps at the bottom of the well, or down in the well, that discharged into a single discharge pipe, but contained an inner pipe which in turn enclosed the shaft, the discharge being outside of the inner pipe and inside of the outer pipe. Then the bearings were contained inside of the outer pipe; in fact, as I recall it, going clear through and joining the two pipes together and holding the shaft rigidly in place. The shaft that attached to the driving head above entered the center pipe and left it, entered the pump below and separated it from the discharged water. So that in both cases there was no contact between the water discharged by the pump and the shaft."

This drawing, it will be observed, is more than a year prior to Layne's filing date.

As for drawing No. 4 (Ex. M-69) of the Pabst actual installation see Pabst proposed agreement of April 20th, 1903, defendants' Exhibit "M-22" (R. 111) where appears the *first written description* of Mr. Jackson's encased line shaft pump.

"PUMP—To be of the Centrifugal Series type four (4) or more steps, having a capacity of 700 gallons per minute; Revolutions not to exceed 1500 per minute. *The pump shaft to be encased in a pipe within the discharge pipe.*

*Bearings approximately every ten (10) feet and suitable means provided for oiling same which will allow no mixture of the oil and water. Total length from bottom of suction to discharge at top of well, 200 feet. The pump to be suspended in the well by the discharge pipe."* (Italics ours.)

oil This drawing No. 4, though dated June 8th, 1903, is exactly described in Byron Jackson's letter to Mead of April 29th, 1903, Exhibit "M-4" (R. 164-166) where Mr. Jackson wrote describing the shafting as enclosed by a jointed tube that was water and ~~air~~-tight and in which there were drain pipes to let out the oil at the bottom, thereby foreshadowing defendants' structure, saying:

"You will note that the *shafting is inclosed in a 4" pipe and intended to be water and oil tight, and the oil fed in at the top, letting it find its way through each bearing and down the pipe to the pump, where there is arranged suitable drain pipes to permit the water to drain out of the pipe what leaks through the last bearing of the pump where the waste oil will also get out and be pumped through the water, which I presume some people will object to, but as you know, it is a very homeopathic quantity and does no harm.*" (Italics ours.)

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**BYRON JACKSON PUMP ON SALE BEFORE  
LAYNE'S INVENTION.**

Prior to this, as shown by defendant's Exhibit "M-21" (letter of Byron Jackson to Mead, April 15, 1903) a bargain had been struck regarding this pump by an offer to purchase and acceptance of

the terms, so that we might well say that the Byron Jackson pump was "on sale" as early as April 15th, 1903; this being sufficient in itself under the statutes (Sec. 4920) to effect anticipation of Layne.

This correspondence shows due diligence on the part of Byron Jackson.

"And as matter of law we see no difference between the right of a defendant to show the time of conception of an unpatented anticipating device, as also diligence in reducing it to practice, and the right of a plaintiff to do this in respect of a patented device. We conceive this to be the necessary effect of section 4886 and section 4920, paragraphs second and fourth, of the Federal Revised Statutes; and these statutory provisions seem to have been substantially complied with in the second and third paragraphs of the answer when read in connection with the eighth paragraph. It cannot be that a patentee can escape the defenses either that he 'unjustly obtained the patent for that which was in fact invented by another, who was using reasonable diligence in adapting and perfecting the same' (second par. 4920), or that 'he was not the original and first inventor or discoverer of any material and substantial part of the thing patented' (fourth par. *Id.*), whether the anticipating object is patented or unpatented. The statute makes no distinction in this regard; it is the fact of prior invention, not the nature of the right under which the invented device is held, that the statute treats as a defense. As Judge Colt said in *Automatic Weighing Mach. Co. v. Pneumatic Scale Corp.*, *supra*, 166 Fed. at 301, 92 C. C. A. 219 (C. C. A. 1):

"'No sound reason has been advanced why the doctrine of diligence should not apply to a patentee as well as to an inventor who has not



secured a patent. On the other hand, any such distinction in favor of patentees is not in harmony with the patent laws.'

"And, when speaking of Mr. Justice Story's opinion in *Reed v. Cutter*, Judge Colt said (166 Fed. 302, 92 C. C. A. 220):

" 'According to *Reed v. Cutter* (Fed. Cas. No. 11,645), . . . Section 15 of the Act of 1836 (containing in substance pars. 2 and 4, Section 4920) secures to the first inventor the prior right, provided he uses reasonable diligence in adapting and perfecting his invention and the rule applies to all inventors, whether patentees or otherwise.' "

20th Cent. Co. v. Loew Co., 243 F. 373,  
C. C. A., 6th Cir.

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#### THE PABST INSTALLATION A CONTINUING ACT.

"Indeed, the whole doctrine of conception, as differing from reduction to practice, is excellently set forth in *Christie v. Seybold*, 55 Fed. 69, 76, 5 C. C. A. 33, 40, by the present Chief Justice when Circuit Judge, in saying that he who

" 'first conceives, and in a mental sense first invents, a machine, art, or composition of matter, may date his patentable invention back to the time of its conception, if he connects the conception with its reduction to practice by reasonable diligence on his part, so that they are substantially one continuous act.' " (*Curtiss Corp. v. Janin*, 278 Fed. 454-57.)

While the Pabst installation was not completed until some nine months after Layne filed his ap-

plication, it cannot be denied that Byron Jackson was ahead of Layne as to *conception, disclosure and drawings*, assuming, of course, that there is similarity between Layne's alleged invention and that of Byron Jackson.

It took Layne but a few days to convey his yet immature conception to a patent attorney and get an application for patent on file. Although this filing date gave Layne a so-called "constructive reduction to practice", it ought not to avail him as against the practical work of Jackson where the device shown in the Layne patent is impractical and the features giving it novelty have as Layne admits been abandoned.

"The reason hitherto successfully urged, for preferring Janin to Curtiss, is that Janin first 'reduced to practice'—a phrase of which the full meaning is also vital. Reduction to practice is not merely a matter of construction, building and trial, but may consist in the disclosure of the idea by any kind of description, pictorial, verbal, or written, which will enable one skilled in the art to make and use that which is disclosed. We think a drawing may possibly be a sufficient reduction to practice, and an experimental machine insufficient, for the question is one of degree, and the ultimate test is always whether the inventor has shown operative means to that theoretically omnipresent person, the man skilled in the art. *Macomber, p. 68. But see Automatic, etc., Co. v. Pneumatic, etc., Co., 166 Fed. 288; 92 C. C. A. 206, and McCreery, etc., Co. v. Massachusetts etc. Co., 195 Fed. 498, 115 C. C. A. 408.*" (*Curtiss Corp. v. Janin, supra.*)

Had Byron Jackson chosen the same course he could have filed an application on a practical and worth-while design at least an entire year before Layne's filing date. Instead, Byron Jackson proceeded diligently with his work; always maintaining, justified by subsequent experience, that no manufacturer who knew his business could honestly guarantee to keep the oil after it has passed the pump bearings from escaping into the well. Beside Mr. Jackson was dealing with a customer some two thousand miles distant and it took time to make his ideas prevail on that point. (The fact that Layne took out a patent and showed and claimed such a means is no proof of its *practicability* in the light of experience.)

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**BYRON JACKSON DEFENSE LONG KNOWN TO AND FEARED  
BY PLAINTIFF.**

That the Byron Jackson prior invention was for a long time known to and feared by the plaintiff is evident from the very significant letter written by Mr. Bowler to Mr. Layne, dated November 13th, 1911, appearing (R. 870) herein and reading as follows:

"M. E. Layne, Esq., Houston, Texas.

"Friend Layne: Referring to the copy of following letter (letter from Mr. Mead of Nov. 7, 1911, to Layne & Bowler Corporation, Los Angeles, Cal., see R. 869) it occurs to me that I had better let you get hold of this fellow and not correspond further with him. He is an old

man, having such evidence as this, which I am sure the Byron Jackson Company have in their possession, it is hard for me to get the right kind of a deal out of them. If you cannot attend to it at once, let me know and *I will endeavor to get him straightened out and agree that it was in the same year the drawing was made and sent to me, that the sketch was made, etc.*" (Italics ours.)

Layne admits receiving this letter (R. 871).

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**THE LAYNE PATENT AS CONSTRUED BY PRIOR  
ADJUDICATIONS.**

Bearing in mind that the *Byron Jackson defense* has never been before any of the courts in the past being an *entirely new defense* and that the *Alvord* and *Eisler* defenses, aside from appearing never to have been considered, may also be considered as a new defense this court nevertheless will be materially assisted in the construction of the Layne patent by its prior judicial interpretations.

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**THE EL CAMPO CASE.**

The Circuit Court of Appeals which decided the El Campo case construed this El Campo decision as follows (213 Fed. 805, *Van Ness v. Layne*):

"In the El Campo Case, 195 Fed. 83, 115 C. C. A. 115, the court held the patent valid as to claim 13, and that that claim had been infringed. As we understand, the validity of claims 4, 9 and 20 were not passed upon by the

court, but were held not to have been infringed. In the present case we are satisfied that claim 13 is not infringed by the Van Ness pump. The last clause of claim 13 reads, 'the casing being closed at the top and provided with an air vent.' While the Van Ness pump is closed at the top, it is not contended that the pump has an air vent such as the patented pump had and such as the El Campo pump had. One function of this air vent is to force any water or spent lubricant remaining in the casing, out of it, through an aperture in the top, by forcing air through the air vent into the casing, for the purpose of substituting clean liquid or oil. It seems clear that the Van Ness pump had no such member with a corresponding function as the air vent of the patented pump or that of the El Campo pump, and so cannot be said to infringe claim 13. This, if correct, would prevent complainant from relying upon claim 13 in this case, as a ground of recovery."

The foregoing would seem completely to dispose of the contention of the plaintiff in this case that the present defendants infringe claim 13. The court's analysis of claim 13 obviously excludes the Western Well Works pump from that claim.

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#### THE VAN NESS CASE.

The Appellate Court in construing the Layne patent brings out clearly that the features so much stressed by plaintiff in all the litigation, to-wit, the "means for supporting the pump and shaft and casing at any desired point within the well," simply referred to the "system of wedges" (page

806 Van Ness Case). This disposes of any claim plaintiff may make that Western Well Works has any "means for supporting the pump and shaft and casing at any desired point within the well." Manifestly, Western Well Works has no "system of wedges" nor any equivalent therefor.

The court in construing claims 9 and 20 says that the *two claims are substantially one and the same*. Thus at page 807 the court said:

"Giving claim 20 this interpretation (that is construing the words 'line shaft' as referring only to the part of the pump shaft which alone can be enclosed in practice), it seems that it is substantially like claim 9, except in the omission of the element of jointure or extensibility of the shaft sections, which adds nothing to the novelty and patentability of the device; and that the element common to each claim, viz., the protective or closed casing surrounding the pump shaft from the pump to the top of the well and entirely closing off the water in the well from the shaft and its bearings, is the only element in any one of the claims as to which there is persuasive evidence in the record both as to patentability and infringement."

Continuing, the court says:

"The word 'closed' in claim 9 seems to mean as much as the words 'entirely closed' in claim 20."

Continuing, the court says:

"It seems quite clear that the idea of a protected casing for a pump shaft without restrictive interpretation would contain no novelty and would not be patentable, and, if this ele-

ment in the patent is given the unrestricted meaning that its language admits of, it would destroy the claim."

The court then proceeds to limit the claim so as not to destroy it. Against the contentions of the defendant in that case that the claims be given the unrestricted generic meaning suggested by the broad language employed, complainant there argued that the specifications should be looked to to interpret the claim and, to use the language of the court:

. . . "that it should be held to mean only a protective casing of the kind and with the functions set out in the specifications. . . . If so limited, it would seem that the protective casing intended to be covered by the claim was one of the kind described in the specifications and having the three functions attributed to it by the specifications, namely: (1) To exclude water and detritus from the shaft and its bearings; (2) to provide a means of lubricating the bearings of each section of the shaft from the top of the well without removing the apparatus from it; and (3) to align the bearings and the shaft so as to prevent lateral displacement in the well and keep the shaft in a vertical position."

In the next paragraph the court says:

"Giving the claim this significance, it fairly appears from the record, as we see it, that there was no protective casing in the prior art of the kind and with the functions of that of the patent in suit. It also seems fairly to appear from the record that such a protective casing as that set out in the specifications contained novelty enough to constitute invention."

The court, therefore, held the claim valid, but chiefly it appears because in that case there seems to have been conceded that Layne supplied "an unfilled want" for apparatus of this sort. Of course, there is an utter absence of any such showing on the part of plaintiff that Layne's patented pump filled any such long-felt want.

*Such commercial success as the plaintiff corporation may have achieved, has been due, no doubt, to an extensive, and if we may be permitted to use the expression, uncharitable system of advertising and intimidation of competitors.*

(See Restraining Order of Judge Van Fleet granted these defendants, R. 28.)

In the Van Ness case the Honorable Judges, having conceded patentability to Layne, but within very narrow limits, pass on to the question of *infringement*, concerning which the court says (p. 809):

. . . "It seems that the question of infringement, like that of patentability is a *close one*."  
(Italics ours.)

In finding equivalency the court says (p. 809):

"However, the record shows that protection against water and sand is afforded by defendant's casing to all but one of the bearings and to the shaft in the same degree as by that of the patented casing, at least during the period of the pump's operation, and that the protection afforded by defendant's casing is different only in degree from that afforded by the patented casing. The closure in the patented casing is



effected by stuffing boxes as well as by the presence and downward pressure of the oil between the bearings and the shaft, which serves to keep the water from pressing upward into the shaft casing between the bearings and the shaft. The closure in defendant's casing is effected by the last method only, and without the use of packing or stuffing boxes."

The court attributes the other two functions of the Layne patent to the defendant and, finally, in resolving the issue in favor of Layne, *chiefly on the evidence that seemed to be in that case as to commercial use* of the Layne structure, admits its own difficulties and says (p. 809):

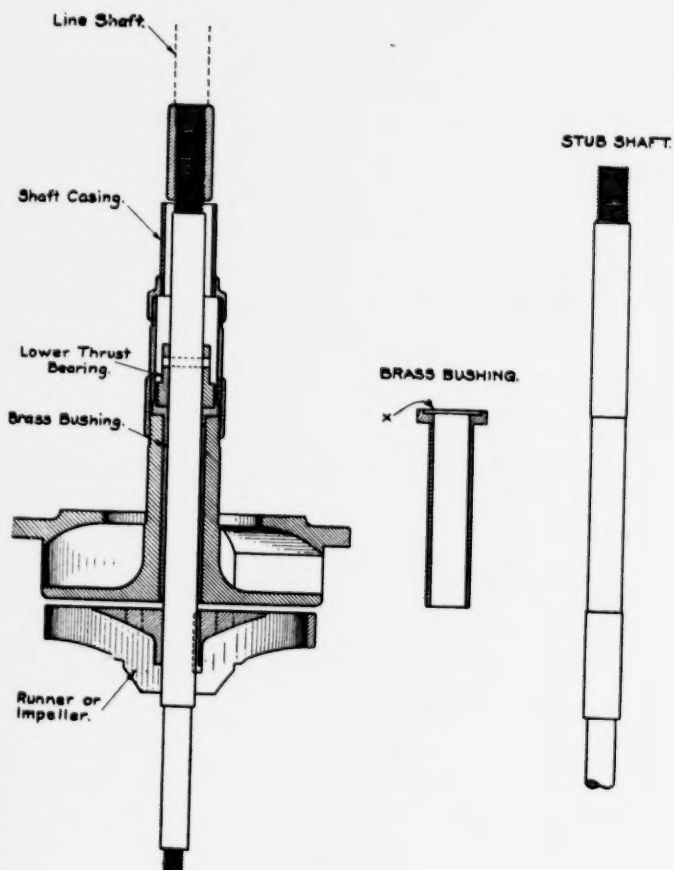
"We must confess that we are not mechanics enough to determine with any assurance from the record the merits of these respective contentions, and *it seems that the question of infringement, like that of patentability, is a close one.*" (Italics ours.)

The court finally saying (p. 810):

"Comparing the conceded practical benefit that has been derived from Layne's patented pump with the theoretical argument of the defendant, we have come to the conclusion that the former should prevail, and that claim 20 of the complainant's patent should be sustained, and that the defendant's apparatus should be held to infringe it in the one respect of a closed casing for the pump shaft of the design and with the triple function attributed to it in the specifications of Layne's patent."

In the present case there is no concession of any "practical benefit" that has been derived from Layne's patented pump. The present testimony

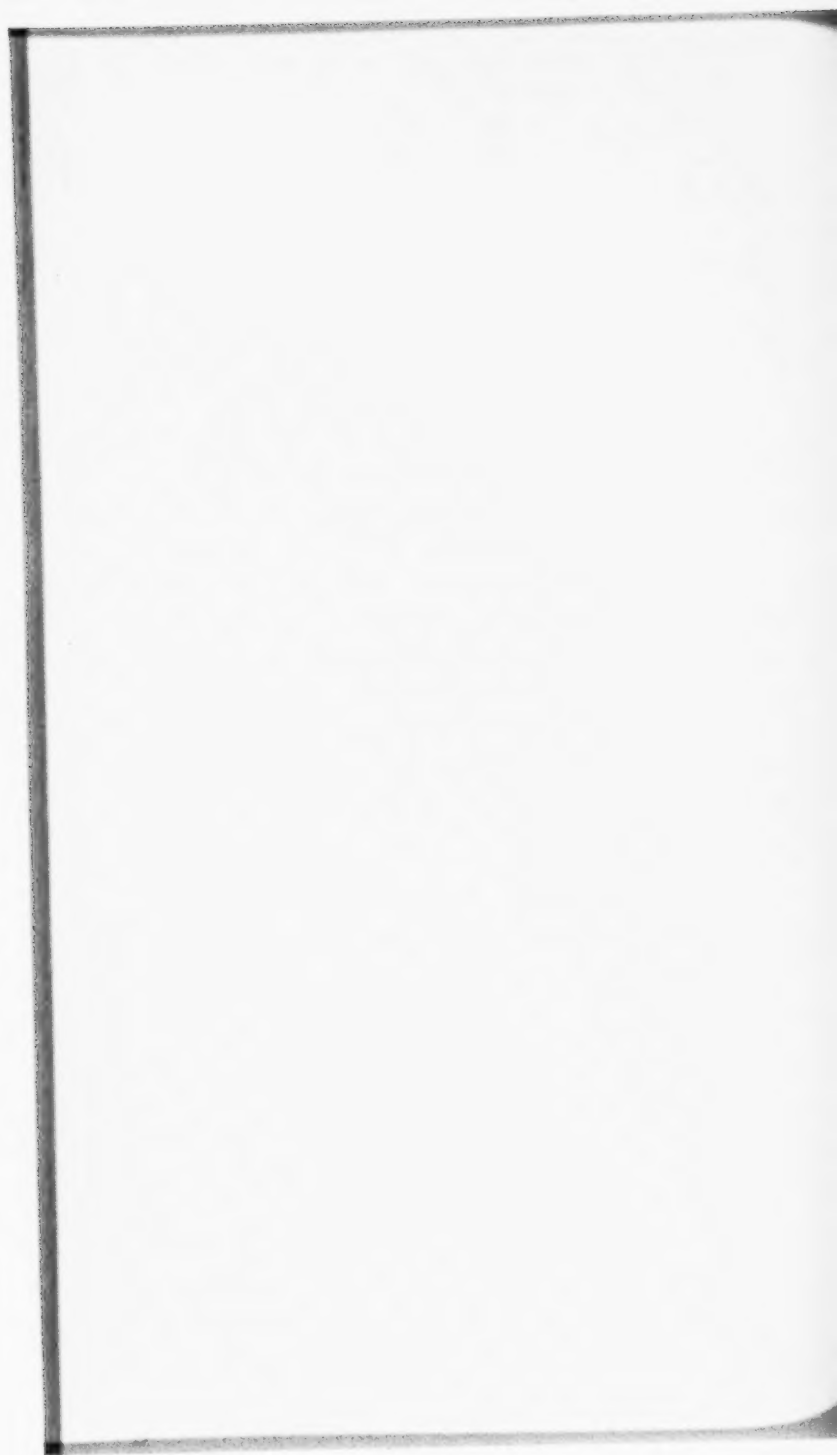
**VAN NESS PUMP**  
(Held to Infringe in case of  
Van Ness vs Layne 213 Fed 805.)



Reproduction from Plaintiff's Brief Van Ness Case, with following legend:

**COMPLAINANT'S EXHIBIT DRAWING ACTUAL VAN NESS PUMP (C. E., p. 366).**

Note the groove marked X worn by contact between the power Thrust Bearing and the upper surface of the Brass Bushing, refuting Van Ness' testimony that in operation these parts do not engage (Our brief, p. 47).



shows, aside from the fact that Layne probably borrowed his ideas from Byron Jackson and Alvord, that the patentee has discarded "wedges," "stuffing boxes," "air vent," "oil blow-off means," and his system of lubrication generally, "splined slip-joint shaft," "thrust collars" at the shaft joints, and practically everything that he may be said to have ever *invented* and that no one of these several Layne "inventions" is now or ever has been used in practice *by anybody*.

The opinion in the Van Ness case leaves the character of the Van Ness structure in doubt, but by referring to the Getty case (262 Fed. 141, 144) we find that Van Ness used "*thrust bearings and a collar to help close the bottom of the shaft casing.*" On the opposite page is reproduced a cut of the Van Ness drawing taken from the brief filed on behalf of Layne in the Van Ness case, and which brief we beg leave to file herewith. In connection with this drawing the following argument was made by Layne's attorney there:

"An examination of this exhibit also makes clear the falsity of Van Ness' representations as to the lower thrust bearing. Van Ness testified that in actual operation the thrust bearing was drawn up so that it did not rest on the top of the brass bushing. An examination of the actual Van Ness pump which has been in use one season shows that the lower thrust bearing must have contacted with great force upon the top of the brass bushing, as it has worn its way down into the top of such brass bushing to the distance of 7-32 inches. This will be clearly understood by reference to the drawing of the actual Van Ness structure, which shows that the power thrust bearing has worn a deep path in

the top of the brass bushing. See the recess marked X on the drawing. This corroborates Wilson's testimony as opposed to that of Van Ness, and explains the success of the apparatus in keeping water out of the casing. It will be obvious that it would be impossible to get any more effective seal against water than that secured by the heavy bearing contact between the lower face of the lower thrust bearing and the upper face of the brass bushing, particularly when such surfaces are oiled. The witness Van Ness knew perfectly well that such a contact would make an absolute seal against water, and this explains the reason for his testimony to the effect that in operation the lower thrust bearing was drawn up so that its lower surface did not contact with the top of the brass bushing. As pointed out very clearly by the witness Wadsworth, this thrust bearing constitutes a much more effective seal against water than any stuffing box could, and has its counterpart in the Layne patent, in the thrust bearing 48 which would serve to keep out the water from the shaft casing, even though the stuffing box 41 were dispensed with."

The decision of the Van Ness case, taken in connection with the foregoing extract from Layne's brief and the reproduced drawing, makes it evident that the court was of the opinion that the Van Ness lower thrust bearing and collar *constituted a seal for the lower end of the line shaft casing*, and, in view of the holding in the El Campo case, this seal is an essential element of claims 9 and 20, which element was not found in the Getty construction. Manifestly, *it is not found in the Western Well Works construction.*

We are further aided in connection with this matter by reference to Judge Jack's decision, R. 1007, wherein Judge Jack has said (R. 1001):

"There is this difference between the Van Ness and the Getty apparatus. *In the former the weight of the shaft is largely sustained by a thrust bearing near the bottom of the casing, so that the pressure on the thrust bearing would tend to make the casing nearer waterproof.* In the Getty apparatus, which rests on the bottom of the well, there are no thrust bearings, but all the bearings are of the ordinary kind, so that, as argued by counsel, more water would pass into the shaft casing of the Getty pump than into that of the Van Ness pump." (Italics ours.)

We thus see at the Van Ness stage of the litigation that the court appreciated the *mechanical closure means* of Layne that were essential at the bottom of the shaft tubing, to make anything like a "closed casing." In Layne, as the court says, "the closure in the patented casing is effected by stuffing boxes"; and in Van Ness it was effected by "thrust bearings and a collar to help close the bottom of the shaft casing." The importance of "mechanical closure" is emphasized in the Getty case as we will see.

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#### THE GETTY CASE.

The Getty case first came before the Circuit Court of Appeals (222 Fed. 917) on appeal by the *plaintiff* against the refusal of the lower court to grant a Preliminary Injunction based on the prior

adjudication in the Van Ness case; the court saying (p. 98):

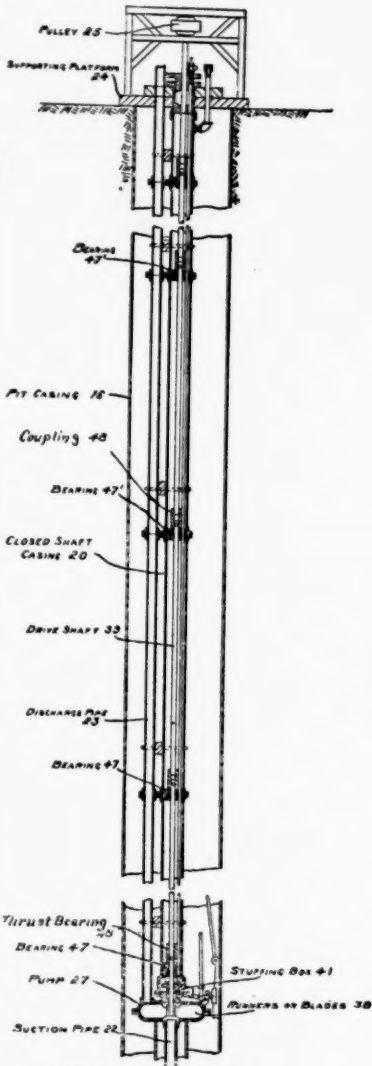
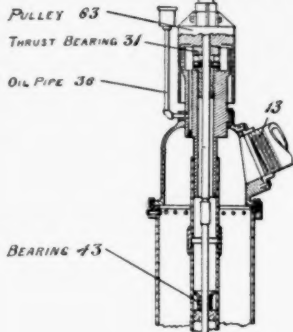
"A hearing was had upon the motion for a preliminary injunction, based upon *ex parte* affidavits, and the injunction was refused. To review this order the appellants have brought the case to this court.

"Claim 20, sustained as valid by this court in *Van Ness v. Layne*, 213 Fed. 804, 130 C. C. A. 462, is the only claim of the patent involved in the present controversy. As before stated, the hearing before the District Judge was had upon mere *ex parte* affidavits. Appellee denied that his improvement infringed claim 20 of appellants' patent, and it is apparent from an examination of the contradictory affidavits that the question of infringement *vel non* is left in considerable doubt."

The court held that there had not been an abuse of discretion and denied plaintiff's motion. This in itself does not speak a high regard for the Layne patent in the mind of the Court of Appeals.

In 262 Fed. 141, the case, after final hearing, comes again before the court for review following Judge Jack's decision sustaining the patent and adjudging infringement *against his own better judgment*; the attitude of Judge Jack being indicated by the following excerpt from his opinion in referring to the argument that there was no invention over Crannell in interposing intermediate bearings and oiling by simply letting the oil run down from bearing to bearing as would occur to anyone and had always been the method of oiling vertical shafts:

GETTY

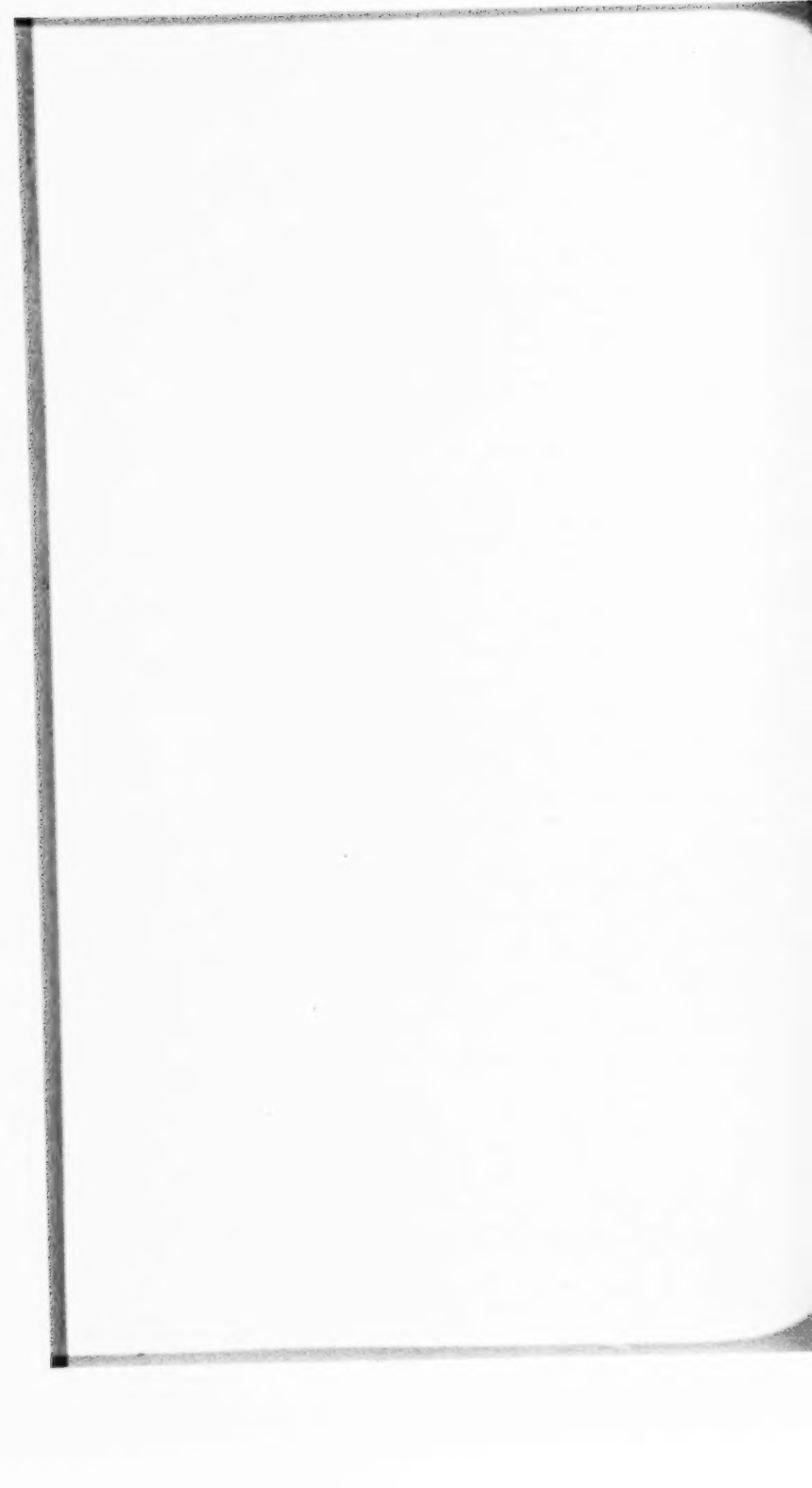


**COMPLAINANT'S APPARATUS.**

### Comparison of Complainant's and Defendant's Apparatus.

Note. Both devices have "a closed shaft casing" (see casings, 20 and 15), and both devices have bearings (47' and 43). Supported, protected and lubricated in closed shaft casings. The casing enclosing the bearings is admittedly a new thing in the art (Brief p. 6).





“The court is much impressed with this argument. The insertion of additional bearings to prevent whipping of the shaft where the distance between bearings is too great, is as simple and natural a thing to do as the putting in a fence of extra posts to prevent sagging of a barbed wire, where the posts of the panels are too far apart. Were the question a new one, *I should be inclined to hold the patent invalid*, but the same issue was raised and directly passed on by this Court and by the Court of Appeals for the circuit, in the Van Ness case sustaining the patent.” (Italics ours.)

On the further question of infringement, Judge Jack, feeling bound by the ruling of the upper court in the Van Ness case, says in conclusion:

“As stated by the court in the Van Ness case, the questions both as to patentability and infringement are close ones. The evidence on the first question is practically the same in the case at bar as in the Van Ness case, and on the second question I think there is no substantial difference in the features of the Van Ness and Getty pumping apparatus as to which infringement is claimed.

“Following the ruling in the Van Ness case, specifications numbers 9 and 20 must be held to be valid and to be infringed by defendant’s pump.”

The Court of Appeals, however, took a different view of the question of infringement and reversed Judge Jack, holding that Getty did not infringe. On the opposite page there is reproduced a drawing of the Getty structure taken from the plaintiff’s aforesaid brief in the Getty case. The comparison they attempted there to show infringement was, of course, futile.

**STUFFING BOXES IN LAYNE BOTH TOP AND BOTTOM TO  
EFFECT CLOSURE.**

The court in its opinion, *supra*, handed down since the filing of the Bill of Complaint in this case, sustains the Layne patent on admittedly a "shoestring" basis. At page 142 of the Getty case the court says, in pointing out the alleged advance of Layne over Crannell:

"Layne solved his problem by the use of a jointed shaft with intermediate bearings, lubricated from the top to the bottom by gravity, and protected from the water and sand of the well by being inclosed in a casing, which excluded both sand and water from the bearings and shaft. He accomplished its adjustment to vertical positions in the well hole by suspending the shaft, pump and casing from the top of the well, and by a system of wedges holding the well mechanism in position when adjusted. The suspending of the well mechanism from the top also enabled Layne to keep the shaft in alignment through the added stiffness given by the downward thrust of the weight of the pump and shaft. This downward thrust also helped to effect the closure at the lower bearing against the entrance of sand and water. However, the specifications of Layne's patent show that *he relied upon stuffing boxes at the top and bottom of the shaft to effect the closure, and to prevent entrance of water and sand*, to the detriment of the shaft and bearings." (Italics ours.)

Then in construing claim 20 (which had previously been held to be identical with claim 9) the court says:

"The twentieth claim of the patent—that sustained in the case of *Van Ness v. Layne*, *supra*—covered 'the combination of a well cas-

ing, a rotary pump therein, and a line shaft for the pump *entirely closed off from the water in the well.* Validity was given this claim by defining a closed shaft to be one having the three functions of (1) aiding the alignment of the shaft in the well casing; (2) providing for lubrication of the shaft and bearings; and (3) protecting the shaft and bearings from water and sand. The question of adjustment did not enter into the discussion in that case. The closed shaft of the claim was restricted, as above stated, by referring it to the character of inclosed shaft described in the specifications of the patent. *It was only by giving the claim this restricted meaning, and limiting it to the description in the specifications, that the claim could be sustained.*" (The last sentence italicised is our; the first italics are the court's.)

Continuing, the court says (p. 143):

"The Layne patent too nearly resembles the Crannell patent to be called a pioneer. . . . Its merit was in adapting the Crannell type of pump to a narrow and deep well hole, in a way that has been held by us to exhibit novelty. While the substitution of mere mechanical equivalents for the means adopted by Layne could not avoid infringement of his patent, it is also true that the range of equivalents cannot be enlarged upon the idea that his patent was a pioneer one in the pump art. *Its advance over Crannell prevented Crannell from being considered by us an anticipation, and was enough to show novelty, but it stops there.*" (Italics ours.)

The court then applies the rule of law that a *functional result is not patentable but only the means of its accomplishment*, saying (p. 143):

"The Layne patent must rest, not upon the idea of closure, which would not be patentable

apart from the method by which it was accomplished, but upon the *means of its accomplishment*, as disclosed by the specifications of his patent. The means which he adopted to accomplish adjustment we are not here concerned with, because the Getty pump has no means of adjustment up and down in the well." (Italics ours.)

It is self-evident that the Western Well Works "has no means of adjustment up and down in the well."

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**"STAGNANT" VS. "CIRCULATORY" SYSTEMS OF  
LUBRICATION.**

The court in the Getty case next passes to the crux of the case and finds that Layne's system of lubrication is a "stagnant" one, while Getty adopted a "circulatory" system of lubrication. "These functional differences between the stagnant and circulatory systems of lubrication prevent their being considered as merely mechanical equivalents."

The court says (p. 154):

"Layne's method of lubrication was to put the oil in at the top and to permit it to descend to each of the bearings, and remain *stagnant* within the shaft casing until ejected from the top after it had become spent, by air pressure through an air vent. When it was ejected, it was replaced by clean oil from the top again. On the other hand, the oil was confined at the bottom of the well by use of a packing or stuffing box. Getty adopted a *circulatory* system of lubrication. By it the oil was also introduced from the top, and descended to the lower bear-

ings by gravity. However, at the bottom there was only a partial obstruction to its exit, presented by a long sleeve bearing. Its passage out from the shaft casing was automatic and continuous, so that there was a constant and free flow of lubricant from the top of the line shaft, throughout its length, and out through its bottom. This method was claimed to be necessary to Getty's device, because wear on the upper bearing required a continuous supply of fresh oil for its proper lubrication. *These functional differences between the stagnant and circulatory systems of lubrication prevent their being considered as merely mechanical equivalents.*" (Italics ours.)

In further explanation of this the court points out (p. 143):

"Layne, according to the specifications of his patent, effected his closure at the top and bottom of his shaft by the presence of stuffing boxes, assisted by the effect of a downward thrust bearing and collar. In practice, Layne soon abandoned the use of packing boxes, substituting therefor a long sleeve bearing and retaining the collar. The downward thrust of the weight of the shaft and pump, together with the downward pressure of the column of oil in the shaft casing, accomplished his closure. While the pressure of the column of oil against the outward column of water is now urged by Layne as important in his means of closure, it is true that it is not stressed, as such, in the disclosure of his patent. Principal reliance is there placed on the use of stuffing boxes."

Concerning Getty's mechanism the court says (p. 144):

"Getty's mechanism is free from any such closure device, either against the flow of oil out-

ward or the flow of water inward, except the long sleeve bearing, without either a collar or the advantage of the downward pressure from the suspended apparatus. Getty relies for closure upon the downward pressure of the oil column balancing the upward pressure of the water column. His mechanism prevents him from availing of packing boxes to effect closure, because they would equally prevent the exist of the oil, which is a necessary feature of his circulatory system. The same reason would prevent his using a thrust bearing with a collar."

Finally, the court held that the constructions were not only *functionally* different but that the "*physical obstructions* such as packing boxes and thrust bearings" in Layne did not find their mechanical equivalent in Getty's partial closure "effected by balancing the pressure of the column of water outside the shaft casing against the pressure of the oil inside the casing, *without the use of physical obstruction*" and therefore held there was no infringement.

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#### THE LOS ANGELES SUIT.

Special Master Helm, in finding that the changed structure adopted by the defendant, the American Well & Prospecting Company, subsequent to the Appellate Court's decision in the Getty case, was not an infringement, says in that case (R. 1096) and following:

"There cannot be said to be any difference in the method of alignment used by the defendants in their structure and the method used by

Layne. The mechanism in both cases is suspended from the top of the well but in the defendants' pump by reason of a slight support of the enclosing tubing on the pump neck there is little tension imposed upon the enclosing tubing.

"The alignment is kept by the use of spiders in the defendants' pump and it is also adopted at intervals in the Layne pump. The use of spiders was a well known mechanism and it cannot be held that the defendants have necessarily adopted that part of the Layne device for the purpose of creating an alignment and there is no new discovery on their part by the adoption thereof.

"With reference to the method of lubrication, however, there was a considerable difference subsequent to January 23rd, 1920, between the methods employed by the defendants and by Layne. Layne's method of lubrication was to put the oil in at the top and permit it to descend to each of the shaft bearings and remain stagnant in the shaft casing until ejected from the top, after it had become spent, by air pressure through an air vent. When it was ejected it was replaced by clean oil from the top again. The oil was confined at the bottom of the tubing by use of a packing or stuffing box.

"The defendants, however, after January 23rd, 1920, adopted a circulatory system of lubrication. The oil was introduced from the top, passed through a short tube connected to the casing and descended along the casing to the shaft bearings by gravity. Before reaching the extreme lower end of the protecting casing it passed through between a long eight-inch sleeve bearing (which surrounds the upper end of the stub and which extends down into the pump neck), and the outside of the stub shaft. This long sleeve bearing was bored 1-64 of an inch larger than the shaft and from the lower end



of the long sleeve bearing the oil passed into a duct in the shaft where there was a passage-way and thence out through the bottom of the stub shaft where the unconsumed oil mingled with the waters of the well. This method was different from anything that had ever before been constructed and provided a means of lubrication from the top to the bottom, prevented stagnation in the oil and made it absolutely circulatory at all times that the mechanism was in operation.

“The defendants’ mechanism is free from any closure device either against the flow of oil outward or the flow of water inward, except the long sleeve bearing. Necessarily the downward pressure of the column balances the upward pressure of the water column. There are no packing boxes in the defendants’ structure as in the Layne invention to effect closure and it is absolutely necessary that there should be nothing to prevent the exit of oil which is a necessary feature of the circulatory system. There is no downward thrust in the defendants’ structure due to the weight of the apparatus as the means of closure. One-half pint of oil is plenty for a ten hours’ run.

“It would appear, therefore, that defendants accomplished lubrication and closure by means so fundamentally different from Layne’s closure in his patent that they cannot be said to be mere mechanical equivalents. The fact that the defendants’ structure either in lubrication or closure are not as complete in effect as that of Layne is an unimportant factor but the structures differ so radically that it cannot be said to be a mere difference in degree.

“Layne’s closure is effected by physical obstructions such as packing boxes and thrust bearings and by pressure of the oil column while the defendants’ closure is effected by the col-

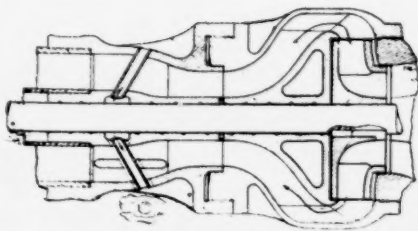
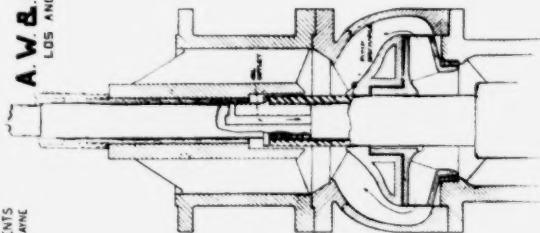
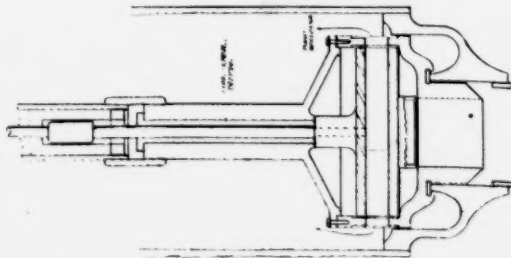
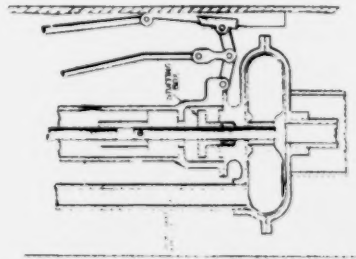
LAYNE PAT.

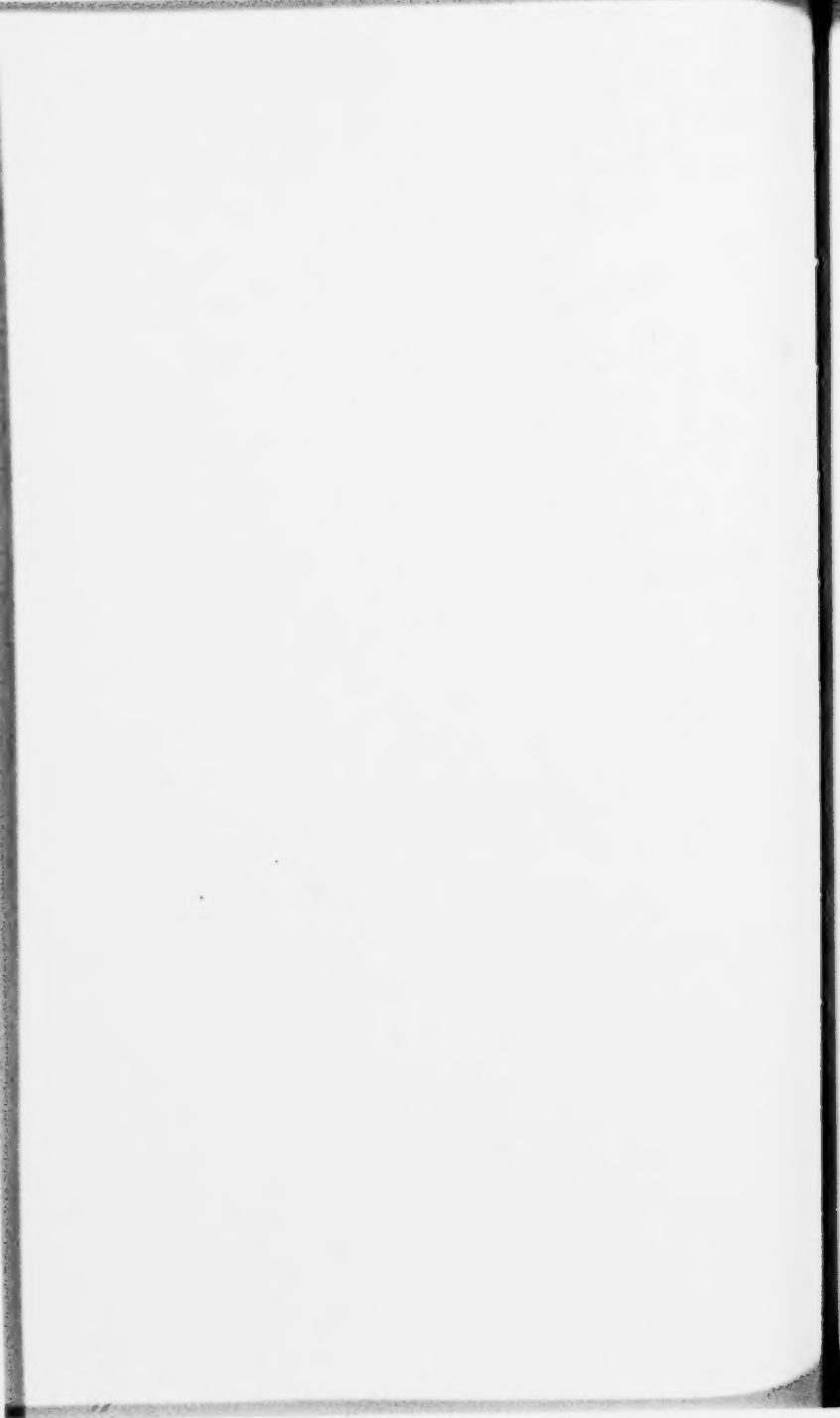
GETTY

NON INFRINGEMENTS  
COMPARED WITH LAYNE

A. W. & P. CO.  
LOS ANGELES

WESTERN WELL





umn of water outside the shaft casing against the pressure of the oil inside the casing without the use of physical obstruction. The difference is one of novelty on the part of the defendants and not adopted merely to avoid infringement.

“The defendants’ structure is suspended from the top of the well but it does not use thrust bearings to help close the bottom of the shaft casing. The differences between the plaintiff’s structure and the defendants’ structure are with reference to the lubrication and closure and are so important that they should not be held to be mechanical equivalents and not to infringe the enclosed line shaft lubrication enclosure of the Layne patent.”

On the opposite page appears a cut contrasting the non-infringing structures, that of the present defendants as well as those of Getty and Los Angeles, with the patented Layne structure.

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#### THE DEFENDANTS’ STRUCTURE.

The defendants’ structure is illustrated by the model, Defendants’ Exhibit “V.” This is a true and correct working model built according to standard shop practice of the defendants.

Mr. Conant says (R. 668), concerning this model:

“This pump model was built on our standard forming tools. The hubs were machined with standard tools, so they would have exactly the same dimensions as those put out in practice. The tubes were reamed with our shop reamers, those which are used in standard practice. If there is any difference in fit between any of them now it would be due to putting them on

and taking them off, which would make them slightly looser by that means; there has been no other change."

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**DEFENDANTS' PATENT TO HALSTEAD.**

Defendants operate under their own patent No. 1,228,770, dated June 5th, 1917, in evidence as Defendants' Exhibit "W" (R. 1109). For testimony, see Lesley (R. 738).

Prof. Lesley has already characterized the lubricating feature of Layne as "a stagnant system of lubrication" (R. 731) "the lubricant introduced by some means into the tube is held there until it becomes spent. There appears no way by which it can be continuously fed. It is simply held as lubricant might be in the crank case of an automobile; it is filled up and it wears out or is burned out, dissipated."

Mr. Doble confirms Prof. Lesley and the Halstead patent when, on direct examination, he quotes from the Halstead patent (page 2, commencing with line 53, R. 840-1):

"It is of course well known that clear water is an excellent lubricant but the tendency of the shaft to corrode renders its use objectionable when used alone. The use of oil alone is highly objectionable as it contaminates the water to such a degree as to become a nuisance when fed from the top or bottom, and requires a more or less complicated system of pipes when fed directly to each bearing, besides adding considerable to the expense of operating. I obviate

S. M. HALSTEAD.

PUMP MECHANISM.

APPLICATION FILED DEC. 20, 1915.

1,228,770.

Patented June 5, 1917.

2 SHEETS—SHEET 1.

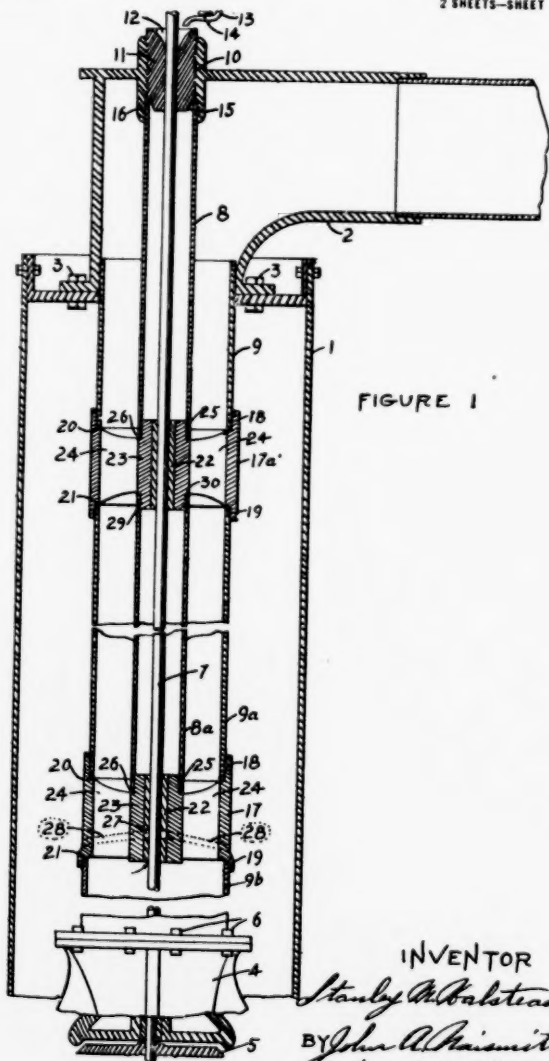


FIGURE 1

INVENTOR

*Stanley M. Halstead*

BY *John A. Smith*

HIS ATTORNEY



these objectionable features by using an oil emulsion as a lubricant as above described, thereby providing a cheap lubricating medium, preventing corrosion of the shaft, not contaminating the water delivered and, on account of the constant flow of water through the bearings, providing an efficient cooling system for said bearings.

"It will be readily seen, of course, that since the conduits are connected to the well proper by channel 27 and auxiliary conduits 28, the water in said conduits will be drained to the level of the water in the well when the pump is in operation, and consequently there will always be a movement of the water into said conduits, down the shaft, through the bearings and out through auxiliary conduits 28. The draining of conduits 8, 8a, etc., in this manner also conduces to economy by obviating the necessity of providing a stuffing-box at the top bearing."

And continuing Doble's cross-examination (R. 841-2):

"XQ. You found present in this Plaintiff's Exhibit 4 the function of the drain tubes with respect to the matter that you first read beginning on page 2 of the Halstead patent, lines 63 to 65?

"A. Yes.

"Q. You found that function present?

"A. Yes, I found that the elements as set forth in that part of the patent are in this Plaintiff's Exhibit 4."

This version of the operation of defendants' structure was adopted by the Circuit Court of Appeals and to some extent by the District Court, although the latter injected some qualifications therein not in any way supported by the evidence.



The Court of Appeals on this phase of the case said (R. 1142):

“Does the lubricating oil introduced into the defendants’ shaft casing pass down through the bearings, and after being used and spent, finally pass out at the bottom of the shaft into the well proper through a channel or auxiliary conduit constructed for that purpose? If it does, then it is not the same mechanical device for lubrication claimed and specified in the plaintiff’s patent. The plaintiff’s device does not have any outlet for the used and spent oil to pass out into the well, and as we understand the mechanical construction of plaintiff’s pump, it was devised, in part at least, for the specific purpose of avoiding that objection.” (R. Vol. 3, p. 1142.) . . .

“The defendants’ pump is substantially the Jackson mechanism with respect to the discharge of used or spent oil from the bottom shaft into the water of the well, and is therefore not an infringement of plaintiff’s patent for an entirely closed casing for the line shaft.” (R. Vol. 3, p. 1148.)

Inferentially, at least, inasmuch as Mr. Doble found the functions and elements of the drain tubes set forth in that part of the patent which he had first read to be present in Plaintiff’s Exhibit “4,” the additional functions of drainage and circulation of the lubricating medium (referring to lines 70 to 103, *supra*) were also present.

“‘It will be observed that channel 27 is placed a short distance above the lower end of bearing 17. This is done so that the lubricating emulsion will traverse the greater portion of the bearing before draining away. That portion of the bearing below channel 27 will not be lubricated, because the upward pressure of the

water being raised will tend to force a small amount of water in the direction of the arrow upward through the bearing, until the channel, 27, is reached, where it will be drained away through auxiliary conduits, 28.' "

And continuing, Mr. Doble says (R. 830) that the Anderson pump, Plaintiff's Exhibit "4," has substantially the same mode of operation, saying:

"Referring to Plaintiff's Exhibit 4 I find the channel, 27, which is shown in the patent drawing, being placed between the ends of the lower bearing, or the bearing immediately above the pump bowl, and from that chamber I find the two conduits, 28, and on examining the shaft of this pump and its bearings, it shows clearly that where the shaft went through the upper bearing it was protected from grease, and the lower part from this point down shows the corrosive action of the water being forced through the bearing. Now, in pumping under high pressure, the water is forced up through this bearing into chamber 23, and is then short-circuited back into the well, where there is low pressure through the channel 28,' . . .

And, on cross-examination, Mr. Doble reads into the record the additional functions of the drain tubes specified by the Halstead patent (beginning with line 70 down to line 103, inclusive, of page 2):

" 'It is of course well known that clear water is an excellent lubricant but the tendency of the shaft to corrode renders its use objectionable when used alone. The use of oil alone is highly objectionable as it contaminates the water to such a degree as to become a nuisance when fed from the top or bottom, and requires a more or less complicated system of pipes when fed directly to each bearing, besides adding consid-

erable to the expense of operating. I obviate these objectionable features by using an oil emulsion as a lubricant as above described, thereby providing a cheap lubricating medium, preventing corrosion of the shaft, not contaminating the water delivered and, on account of the constant flow of water through the bearings, providing an efficient cooling system for said bearings.' "

As said in *California Canneries v. Dunkley*, 247 Fed. 790, 794:

"They cannot offer this testimony as true to prove a material and relevant fact for one purpose, and discredit it for another purpose. If it is true for one purpose, it is true for any purpose."

The defendants' pump is described by the witness Conant, Engineer for the Western Well Works, Inc., beginning (R. 664).

The defendants' structure, as shown both by the model Exhibit "V" and the Halstead patent, may generally be said to embrace a pump which has a shaft to operate the impeller, which shaft turns in bearings which are carried by the *discharge column* of the pump. Between the discharge column and the impeller shaft, which latter is *concentric* with the discharge column, and between the successive bearings, there are interposed sections of pipe surrounding the line shaft and which enclosing pipe or tubing, with the discharge column, forms a conduit for the water discharge. This shaft tubing of the defendants is like Layne in only one particular, and in that particular it is exactly like

numerous structures and patents in the prior art: that is, it affords a protection against sand and gravel carried by the water against cutting out the bearings. The similarity between Layne and the defendants ends there.

The problem in that regard was not new with Layne; for prior patentees like Crannell, Eisler, Ivens, Alvord and others used a tubing around the shaft to protect the bearings from wear. The only difference between them and Layne was in the *degree of the enclosure* effected by their tubing around the shaft. Except Eisler they afforded a protection merely against the abrasion of sand and gravel *but did not exclude water* from the interior of the tubing. Neither do defendants exclude water, while Layne does. Eisler had the Layne problem of exclusion of water although he does not show a stuffing box. The added function of *stuffing boxes* provided by Layne was the *exclusion of the water*, so that a clear undiluted body of oil could be retained in the Layne shaft enclosing tubing, and his shaft bearings would run in a flood of oil. Again we see the pertinency of Professor Lesley's automobile crank-case comparison.

In Halstead the *rigid connection* of all the *shaft sections* together and carrying its entire weight and the weight of the pump impeller on the surface is in marked contrast to the loose telescoping structure of the plaintiff's patent where the pump shaft is in sections each with its collar 47 or 48, *each section carrying its own load*; the slip joint connections

of Layne being in no ways the equivalent of the rigid connected shaft of defendants.

Again, it is to be noted that the *loose disconnected shaft tubings* of defendants are dependent entirely for their support on the *bearings* which are carried by the discharge column, and that the *shaft tubing may be entirely dispensed with and the pump would still function* although it would leave the bearings exposed to the discharging water. This, again, is in marked contrast to the Layne patented structure where the shaft-enclosing tubing is connected as a rigid structure and *the whole pump and its assembly is dependent for support on the Layne shaft tubing*. Remove Layne's shaft tubing and the pump falls apart.

Again, defendants, effect their lubrication on an entirely different principle from Layne, and, in fact, from the prior art for that matter. Halstead as seen above discovered that by using a *loosely jointed tubing* around his line shaft, with each section *shorter than the distance between each bearing* so that a limited amount of vertical play of each section was permissible, and with the *lower end of the shaft tubing in direct communication with the water in the well* through ducts or channels which communicated with the interior of the tubing and the outside of the well eliminating stuffing boxes, and employing a *gravity* feed of his lubricant, that this oil would travel downward from bearing to bearing and eventually find its outlet into the well through the drain tubes. Inasmuch as these pumps

are usually submerged so that the water would back up through the drain tubes and enter the tubing a lubricant could be used known as an *emulsifying oil* which is readily miscible with water; this emulsion forming a good lubricant in itself.

Furthermore, it was found that by making the sections surrounding the tube with loose slip joints adapted to seat merely by friction on hubs, formed above and below the bearings (the tube sections being as above stated each shorter than the distance between the bearings so that a limited lengthwise play of each section between the bearings is permissible, and more or less water would leak in at each of these joints formed between the telescoping ends of the tube sections with the bearing hubs), that this entering water mixing with the emulsifying oil, would further aid lubrication and reduce the quantity of lubricant necessary.

The testimony shows further that where operating under high heads or considerable water pressure, due to the lift, a difficulty was met with by reason of the water entering the tube and flowing *upward* in the tube and out at the top, rather than *downward* and out at the drain tubes. So in order to maintain *circulation downward* rather than upward and to permit the proper infeed of lubricant which is necessary for most effective lubrication, the defendants, early in their operations, provided the shaft bearings with *helical grooves delivering downward*, so that the shaft, which, in operation, is rotated at the high speed of some 1100 to 1200

revolutions per minute produces, as experience shows the phenomenal condition of a *force feed* acting after the manner of a multi-stage pump to create a downward pressure and a forced delivery down of oil and water or any other liquid or viscid substance in the tubing; these accumulating pressures serving to carry downward the emulsion as well as the original heavy greases employed around the bearing when the pumps are first installed and finally ejecting the same from the drain tubes into the well.

The action which will be more fully explained later, of these helically grooved bearings with the open drain tubes is evidenced by a bottle of a brownish liquid identified as Exhibit "Y-10" and representing a mixture of emulsifying oil and an *analine dye* fed in at the top of one of defendants' pumps and after mixture with the water in the tubing being caught by Professor Lesley when discharged at the drain tubes. This exhibit was gathered by Professor Lesley in one of many tests that he made to determine within the range of physical possibilities just exactly what the action was particularly as concerns lubrication in the defendants' pump. These tests, as well as the common sense of the thing, show conclusively that the defendants' pump works on a *circulatory* system of lubrication and is as foreign to the stagnant, crank-case system of defendants as is a stream of pure running water to a cesspool.

*Layne has been judicially determined to be limited to a "stagnant" system of lubrication and,*

*therefore, should not be held to embrace defendants' system which is admitted to be "circulatory."*

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#### THE ANDERSON PUMP.

There is also in evidence as Plaintiff's Exhibit "4" a mutilated section of the so-called Anderson pump, an original installation of the defendants. The history of this mutilated section since it was installed in the well by the defendants is so surrounded with mystery and so much suspicion attached to the so-called "tests" which it was subjected to in the year and a quarter it was in plaintiff's possession, following its removal from the well, that its present condition can in no wise be taken as an indication of operating conditions which these pumps are designed to meet and fulfill. Whether the pump was tampered with or not of course is not known but that it is not in the condition it was in in the well seems to be certain.

However, even in its present condition and with the white lead around the joints of the tubing *hardened and dried by exposure to the atmosphere*, it clearly shows the "drain tubes" through which "circulation" takes place.

Indeed, the "circulation" of the lubricant in the Western Well Works construction is so evident, and the system so manifestly a "circulatory one" that the plaintiff admits the very method of lubrication contended for by defendants.



**PLAINTIFF ADMITS DEFENDANTS EMPLOY A CIRCULATORY  
SYSTEM OF LUBRICATION.**

Mr. Layne in describing the lubrication of defendants' pump, as evidenced by the Anderson pump, says (R. 573):

"In the first place, the tube that surrounds the shafting that enters the bearing is continuous from the pump neck to the top of the well, which makes connection with pump head. A 3-inch pipe connects up through the discharge T into the pump head proper, so that the water, as it is being pumped from the well by the pump discharges up through the casing member here, and outside of the shaft casing. *The lubricant, as it is applied, works its way down through the shaft casing, and—*

"Mr. TOWNSEND.—Now, your Honor, he never has seen one of these pumps in operation, and so he can't tell how it is lubricated.

"The COURT.—Well, he agrees with your statement, anyhow. . . .

"The COURT.—He is stating precisely what you stated in your opening. Proceed with the answer.

"A. *The lubricant is then admitted into the well through the drain port or vent in the pump neck—*" (Italics ours.)

In order to emphasize how the oil traverses the several bearings in the Western Well Works structure gravitating downward until it finally escapes from the tube into the well Mr. Layne further says (R. 575):

"Therefore, we claim that every part of the Halstead structure, or the Western Well Works structure, every pipe, the enclosing casing, performs the same function as our enclosing casing, the bearings perform the same function, the

lubricating performs the same function; the shaft-protecting casing shuts out the sand as it is being pumped through here, so that the lubricant can gravitate or *work its way down* through the shaft casing, and as it *works down* it both lubricates and protects in every way every bearing throughout the entire line of shafting. *One drop of oil admitted at the surface, or a dozen drops of oil, lubricate each bearing as it passes from one to the other,*" . . .

And (R. 582):

"the only difference being that they provide a duct by which the lubricant, when it reaches the top of the pump, can *pass into the well* in place of the lubricant as it works through our shaft-enclosing casing passing in the pump portion and is carried out directly with the water being pumped." . . .

And again this (R. 583):

"Mr. LYON.—Q. From your examination of this Anderson pump, Plaintiff's Exhibit 4, was that a *free circulation* down at the bottom out from the shaft-enclosing casing?

"A. It is free after it comes in contact with the ports, but preceding the [568] entry of the oil at the port opening the oil is retarded at each shaft-bearing." (Italics ours.)

And finally we have this in Plaintiff's so-called Opening Brief (page 103):

"*Lubricant, with the exception of the hard grease packed in the shaft casing by defendants at the time of installing the structure, is fed into the top of the shaft-enclosing casing at 12 and passes or circulates down the casing through each intermediate bearing and through the lowest bearing into the chamber 27 from*

*which it overflows and passes through the conduits 28 into the well."* (Italics ours.)

The figures have reference to the Halstead Patent drawings; the chamber 27 and conduits 28 also being shown in the cross sectional cut of the Anderson pump which appears opposite said page 103 of Plaintiff's Opening Brief.

So inconsistent are plaintiff's counsel that after conceding defendants' lubricating system to be circulatory, page 103, say at page 135 of their Opening Brief:

"With said heavy grease in the casing, on the shaft and in the spiral grooves of the bearings and *thus being found after years of use*, it is obvious that even the lighter, emulsifying oil could not flow freely through defendants' shaft-enclosing casing." (Italics theirs.)

Of course, the word "freely" may be said to save the day and not to constitute a retraction of the previous admission.

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**THE FOREGOING ADMISSIONS OF FACT BINDING  
ON PLAINTIFF.**

Even in the face of the above admissions and weight of evidence and the teachings of the Layne Patent the trial judge committed the fundamental error of comparing the defendants' structure not with the Layne patent but with what appears to be the mode of operation of Layne in his commercial structure, and finds in effect that *both*

systems are circulatory or that both systems *may be* stagnant; the trial court saying (R. 894):

"It is also earnestly insisted by defendants that the two systems are differentiated by the fact that their lubricating system is circulatory, while that of the plaintiff is static. In one or two of the decisions cited *supra* more importance is attached to this consideration than under the evidence here I have been able to accord to it. Under the facts disclosed, the distinction is more apparent than real. In both cases the oil is fed in at the top in substantially the same manner, and under the force of gravity traverses the entire length of the shaft casing, lubricating all of the bearings in its course."

The trial court then continues (R. 895):

"In the actual operation of the plaintiff's mechanism there is necessarily some escape of thin oil through the bottom bearing; for, as already explained, a perfect closure at this point cannot be maintained. Possibly a larger quantity will escape at the bottom of defendants' structure; but even there, it is to be borne in mind, the lubricant must traverse a bearing of considerable length before it reaches the groove, and to some extent its down flow is resisted by the upward pressure of the water, which is only reduced and not wholly eliminated by the means described."

The trial court appears to have misunderstood the evidence on this point. In the Western Well Works' structure the oil is fed *by gravity* from an ordinary drip cup. In the structure as disclosed by the *Layne patent* as well as in the present Layne structure, some means must be provided to *force* the oil in at the bottom and to traverse the bearings *upward* gradually filling the shaft tubing.

There can be no "escape of this oil through the bottom bearing" in Layne, unless the shaft enclosing tube is full and *excess pressure* is applied to it. The "full tube" is the condition of a static or stagnant system, and of Layne.

In the *Layne Patent* there is no "gravity feed;" there is *no* escape of oil in the Layne patent "through the bottom bearing" because the stuffing box is there to prevent that very thing.

"Stagnation" is mandatory in Layne while "Circulation" is mandatory in Western Well Works.

The Trial Court's erroneous view of the situation, at least with respect to the defendants' structure, is shown in the next paragraph of the decision (R. 895):

"Indeed, it is very probable that in both mechanisms a comparatively static condition is, under ordinary conditions, maintained at the lower end of the casing, due to the counter action or counter resistance of the columns of oil and water, one against the other. In the plaintiff's mechanism a contrivance is provided for drawing or forcing out of the casing the residuum of spent or impure lubricants; but it cannot be said that the groove and vents in defendants' structure perform such a function."

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**CIRCULATION HAS REFERENCE SOLELY TO THE OIL PATE**

In none of the adjudicated cases, either Getty or the Los Angeles changed structure, has "circulation" meant anything more than that the "*lubricant*," admitted at the top of the pump, passed down inside the shaft tubing and after oiling the

bearings ~~were~~<sup>was</sup> unobstructed in its escape from the tube at the bottom.

The trial judge and the minority opinion in the Appellate Court in the instant case apparently thought that defendants' "circulatory system" had solely to do with "water circulation" overlooking entirely "lubricant circulation" and ignoring plaintiff's admissions as to the circulatory system of lubrication in defendants' pump.

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DIFFERENCE BETWEEN WATER CIRCULATION AS SUCH  
AND LUBRICANT CIRCULATION.

Whatever view is taken, it is always to be remembered that *water* circulation within the tube is one thing and *lubricant* circulation within the tube is another thing. Western Well has both; Layne has neither. If Western Well has only lubricant circulation from top to bottom, with the lubricant fed in at the top and escape out through the drain tubes 28, it is still fundamentally different from Layne in the same way and to a far greater degree than Getty.

At all times when we speak of a "circulatory" system we are not referring to any necessary ingress of water into the shaft tubing but to the passage of the oil through the tubing and out into the well. That thought must be kept clear at all times and no doubt it was failure to accomplish that thought of lubricant circulation that led to error both on the part of the trial judge and of the Minority in the Appellate Court. Neither should sight be lost

of the admission of Layne's counsel (page 103 of their brief):

"*Lubricant*, with the exception of the hard grease packed in the shaft casing by defendants at the time of installing the structure, is fed into the top of the shaft enclosing casing at 12 and passes or *circulates* down the casing through each intermediate bearing and through the lowest bearing into the chamber 27 from which it overflows and *passes through the conduits 28 into the well.*" (Italics ours.)

At the trial the investigation threatened to develop into a side issue as to just "how tight" or "how loose" the joints were between the tube sections and hubs in defendants' structure. Defendants' counsel, in an effort to save the time of the court and keep to main issues of the case, generously conceded that white lead while used primarily by defendants to prevent corrosion, would serve also to seal the joints against the entry of sand and detritus and also that the tapered fit between the hub and tube, if sufficient pressure were applied in assembling, would form a tight joint. Under defendants' view of the case these points are entirely immaterial and we might have stipulated that no water whatever entered the shaft enclosing casing except for the very good reason that this would be a stipulation against the truth and a denial of a very strong selling point of defendants' pump.

Our position was thus stated on the trial (R 789-790):

Mr. TOWNSEND.—May I interrupt to correct your Honor in that matter? That test was

made to see whether the theory of operation, as is presumed to exist as to what takes place in the well, that the lubricant, or whatever is fed in at one point comes out at the bottom. When Professor Lesley applied the analine dye test at the top and it came out at the bottom, it showed that that pump worked on a circulatory system. In a sense, it was not necessary for us, in view of the admissions that that is what happens in the Anderson pump, where the oil goes from bearing to bearing and out in the well. The tests by Professor Lesley conclusively demonstrated that because they were proof positive to the eye, aside from any other deductive information that may be drawn. It brings our pumps within the doctrine of the Getty case, and the decisions of the Circuit Court of Appeals of the Fifth Circuit, that a pump which employs a *circulatory system of oiling* does not infringe the *stagnant system of lubrication* of the Layne patent. Those tests were proof positive of the circulatory system. The leakage is an incidental feature. If you have some leakage it produces the emulsified action. Where the leakage comes from is not so material. I am referring to this now, because I think it may tend to shorten the rebuttal. If it is intended to prove a tight joint, or a loose joint, I am willing to concede now that that Anderson test, if it shows it is a tight joint, that it is a tight joint. But whether those joints are tight or sealed cuts no figure, so long as there is the *communication of the lubricant* through the tube line and out into the well.

“I want to make our position perfectly plain, and show that we lay all our cards right on the table here, and we are not depending on any fine points as to a loose fit, whether it keeps out water or keeps in water. We did feel that by the demonstration we would have an op-



portunity to observe all the conditions, favorable or unfavorable to us, and to see the conditions as they actually existed. There may have been some leakage, or they may [743] not have been leakage. Water came from somewhere. I think that those tests are highly instructive. Their *bona fideness* will not be questioned, I think, even by the plaintiff, because we are not here to trifle about these matters. This is a serious matter affecting the entire industry, and the business of my client."

Once it is admitted that there is this circulation of the lubricant in defendants' device and that the plaintiff's patent is for a "stagnant" system of lubrication, the difference in principle between the two devices becomes an established fact.

This is made more apparent because in the Getty case, as well as in the Los Angeles case, *the shaft tubing as we have already said was tight from top to bottom and no water could pass from the discharge column into the shaft tube*. When one considers that the clearance between the shaft and its lower bearing adjacent to the pump is not to exceed *1/64 of an inch* (R. 1097), manifestly, not much water can pass into those systems, and yet in the Getty and Los Angeles cases such "tight" joints were held nevertheless to have nothing to do with the fact that the *lubricating* systems were "circulatory" and non-infringing.

*Regarding white leaded joints.*—There seems to be an utter misconception on the part of the plaintiff respecting the use of white lead on the tapered hubs of the line shaft couplings of defendants'

pump. The Halstead patent, as well as the commercial structure of defendants, is based on the idea of the hubs telescoping with the line shaft casing so as to permit of quick assembly. It was found that where the hubs were cylindrical, as shown in the Halstead patent, excess leakage from the discharge column into the line shaft tubing took place, whereby the drain ports were insufficient to carry off this leakage water. This would obviously be the case with any sort of an ordinary telescoping fit of two parts roughly machined and where one side, such as the discharge column side, is subject to high pressure with little or no pressure on the inside.

Accordingly there was developed the tapered hub of the defendants' commercial structure, which modification, in addition to affording a somewhat tighter joint to excess leakage from the discharge column, provided a more easy mode of assembly.

The tapered hubs even then did not accomplish the complete result and white lead was added first to make a tighter joint; and, second, to prevent erosion and, of course, as the white lead is exposed to the atmosphere it becomes dried.

Even *white leaded, tapered* joints in defendants' structure have not prevented leakage, as shown by the Stockton installation.

That the tapered joints and the white lead did not in practice always form a water-tight joint is shown by the testimony of plaintiff's witness, Folsom, who at one time was in the employ of defend-

ants. Concerning one of defendants' installations, known as the Stockton Water Company job, on which said Folsom worked, he testified at R. 616-7 that there was so much water inside the shaft casing or tube due to leaky joints that it came out around the top bearing. Asked what he did to overcome this excess leakage he said:

"A. I changed all of the hubs, that is, all of the combination couplings, in order to get hubs that were tight.

"Q. Did you use white lead in any of those that you replaced?

"A. All of them. . . ."

He then identifies the Anderson pump (Exhibit "4") charged to be an infringement as "an exact duplicate" of the Stockton pump. And at R. 626 he further testified:

"XQ. As a result, there was so much more water in that tube, and the pressure was so great, that it came out around the bearings at the top of the pump?

"A. Yes.

"XQ. What did you do to try to overcome that?

"A. I changed the bearings.

"XQ. You put in there the *spiral grooved bearings*, like Defendants' Exhibit 'C' for identification?

"A. The original one was a *spiral bearing*; I put in one with a tighter hub.

"XQ. But you found your spiral grooved bearing would not even then take care of the water?

"A. No.

"XQ. You still had an excess of leakage water?

"A. Yes.

"XQ. Were you ever able to satisfactorily meet that situation and overcome the difficulty of an excess of leakage water into the shaft tubing?

"A. *Not while I was on the job.*" (Italics ours.)

How can plaintiff, in the face of such a statement of its own witness, contend for its "water-tight" theory?

"Leakage" from the discharge column is not the chief factor of difference here between defendants' device and plaintiff's device; but lubrication by "circulation" in defendants' device as against the "stagnant" system of lubrication of plaintiff. Layne has admitted that oil passes to the bearings in defendants' pump and *out through the drain tubes.*

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**THE TAPERED HUB A FICTITIOUS ISSUE INJECTED  
BY PLAINTIFF TO LEND CONFUSION.**

Inasmuch as the plaintiff has laid so much stress on the relative tightness or looseness of these joints and the trial court appears to have been so impressed by the specious arguments of plaintiff, we shall analyze the evidence and the reasons accompanying the respective explanations given by the witnesses at some greater length than the subject might otherwise merit.

On cross-examination Mr. Conant says that practically all the pumps (except a few at the very first)

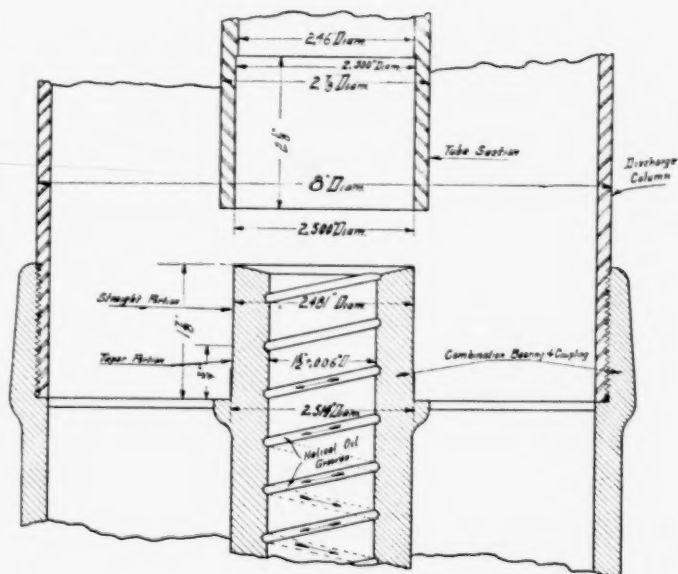
of defendants were made with the hub slightly tapered rather than exactly cylindrical, as shown in the Halstead patent, and states the reason (R. 677):

“The change was a slight taper on the end of the hub nearest to the shoulder. That change was made in order to center the tubes and to provide the necessary seat, because the tubes were shorter than the length of the discharge column.”

This taper begins about  $\frac{3}{4}$  of an inch from the shoulder. *(see cut opposite.)*

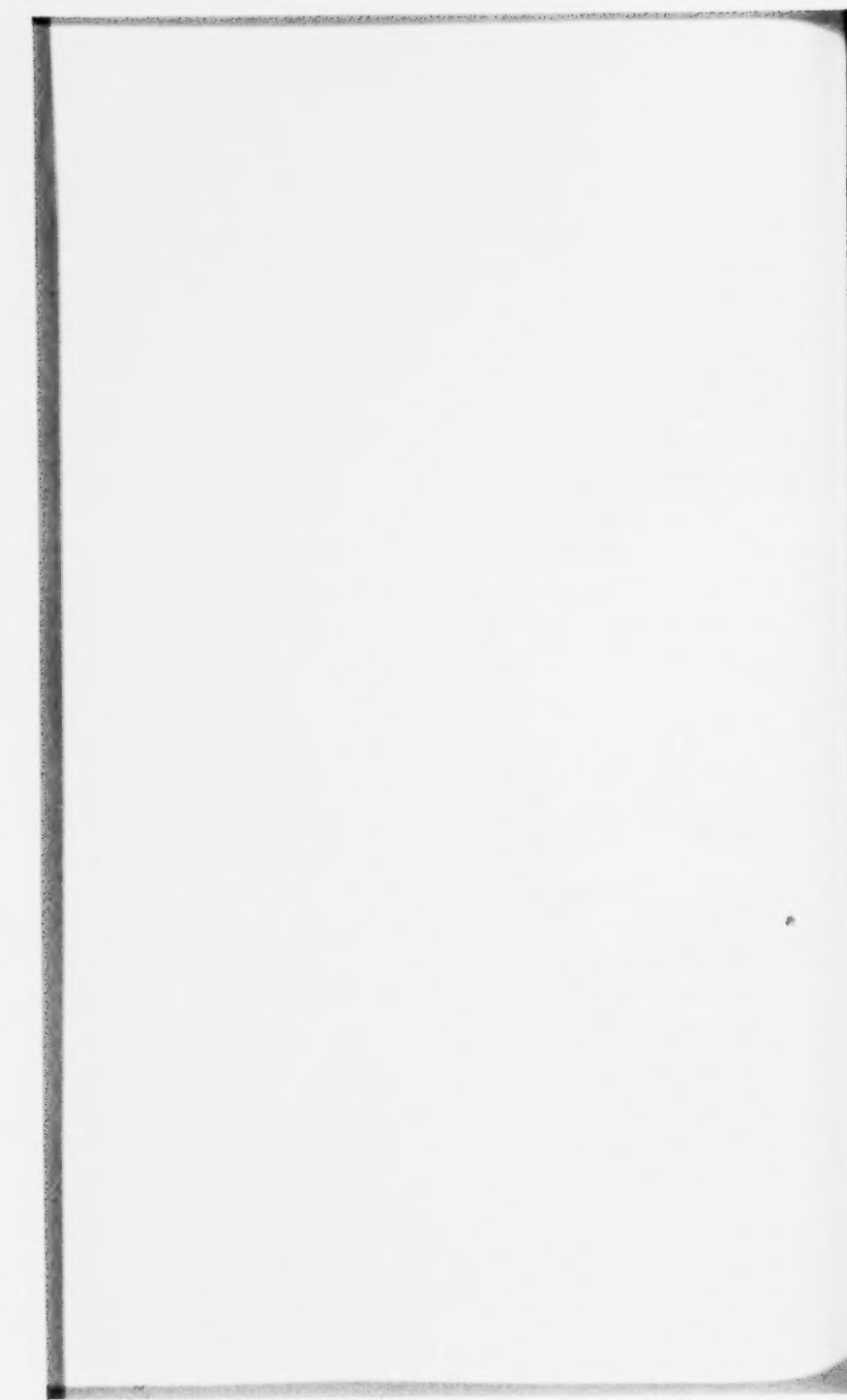
Concerning the degree of tightness or looseness of these joints and the amount of leakage, Mr. Conant testifies (R. 685-6):

“Sometimes when you place this tube over the end of the hub, it will slide to a seat by hand, just of its own weight. In that case there is no pressure necessary to seat it. It will have ridden up close to the seat, but not necessarily on the taper, because that taper, as I have said, is  $\frac{3}{4}$  of an inch long. We never let a tube go out which will not pass down  $\frac{3}{8}$ ths of an inch of shoulder, which means that it has gone half way up on that taper. If they are tighter than that, they must go back and be re-reamed. It must go halfway the length of the taper without any obstruction at all, without any resistance. The rest of that taper is a matter of the particular fit that that tube may come. Taking a reamer, which makes the ends of the tube, finishes them on the inside, those tubes vary in thickness, they run the reamer over it—the reamer is the thing that is gaged; the reamer may go in there and make a variation of  $\frac{5}{1000}$ ths or  $\frac{10}{1000}$ ths, because it will spread after the cut has been taken. So the tubes do not fit exactly alike for that reason; one goes down a certain distance, and



SCALE DRAWING OF  
WESTERN WELL WORKS  
"COMBINATION COUPLING"

Showing 3/4 inch taper at base of hub with 1-1/8 inch cylindrical upper end and smaller than tube to fit over it.



one goes down not quite so far, although they are manufactured by the same tools."

Mr. Conant again says (R. 680) that whilst the sharp edge of the lower end of the tubing resting on the taper might form a tight joint "to a certain degree; sufficient pressure would cause it to leak. *It is not a commercially water-tight joint.* If I were to build a joint to make it water-tight, I would not use that system."

Capital is sought to be made out of the fact that defendants smear a thin coating of white lead over their hubs before they slip the tubes over, the primary object of which appears to be to keep the parts from rusting or corroding.

No one will deny that white lead smeared over a screw-threaded joint and the parts screwed up tight and the lead allowed to dry will make a tight joint. That is a common plumbers' expedient. Likewise this court knows that white lead under water retains its fluidity for a long while and does not dry out; and likewise, it will be recognized that the tube sections of defendants merely slip over the tapered hubs and have a line contact therewith, and if they are not screw-threaded, when they have any screw-threaded connection the tube can teeter or rock at will on its tapered seat. Manifestly the least movement is going to break any tendency to a seal.

If we need any further evidence on this elemental principle we would refer first to the testimony of Mr. Folsom (R. 618):



"XQ. The white lead between the two metal parts in close contact will prevent those two metal parts freezing together?"

"A. Yes."

And (R. 619):

"XQ. You know that it will harden on its exposure to the atmosphere?"

"A. Yes."

"XQ. So if these joints are moistened with white lead under water they do not dry out, do they?"

"A. No."

As Mr. Conant says (R. 681):

. . . "the white lead is sufficiently fluid to be put on with a paint brush. It is not a sticky preparation with enough hardness (to prevent leakage); it will flow with water; *pressure will force water through it.*"

Of course, in the Anderson pump the white lead there has been exposed and hardened and, naturally, the joints are water-tight or supposedly so. Whether these joints are the same now as when the defendants put the pump in the well back in 1916 and as it operated up to the time the plaintiff said they pulled it from the well in May, 1919, is, of course, not apparent. A tight joint *now*, even if it were the controlling issue in this case would by no means argue a tight joint when the pump (100 feet or more in length) was installed and submerged in the well and in operation.

THESE JOINTS FREQUENTLY LOOSE ENOUGH TO BE  
DISCONNECTED BY HAND.

Thus Mr. Bradford, who has had large experience in handling defendants' pumps and installing same says (R. 712):

"Q. In placing the tube sections in position over the hubs, what care, if any, do you exercise?

"A. In so much as the tubing varies in size, the installers sometimes become careless and drop a tube, or when they slide out of the rope sling let them fall; certain tubes that will do no damage, they will tighten up on the hub before reaching the shoulder; other tubes, being looser, go clear to the shoulder, and with the strain of a certain pump hanging on the combination coupling, I have had couplings broken by the jar of the tube falling.

"Q. You spoke concerning white lead around the joints formed between the end of the tubing where it slipped over the hub. What is the object of that white lead?

"A. It prevents the tube casing member from corroding with the hub member."

And, again (R. 718):

"Q. Will those disassembled tube sections and hubs show evidence of white lead here?

"A. They do.

"Q. What is the condition of that white lead?

"A. Practically the same as the time it was put on. *It had not hardened.*"

Frequently the same tubes are put back on the tapered hubs and as witness says (R. 718):

"They will usually run right to the shoulder by their own weight."

And concerning the fit of the tube on its hub witness says (R. 718):

“I do not think the fit is such as to exclude the water.”

Witness Nash for plaintiff on cross-examination (R. 610) says that the telescoping parts were not always of the same size; that a pipe section which fits over the hub of the bearing is sometimes larger in one case than in the other; that in reaming down the tapered end of the bearing the diameter will vary; that the reaming tool or lathe tool will cut at slightly different diameters in treating one section or another and the same way in treating the cutting down of the tapered ends of the hubs.

Nash says (R. 611):

“That is what the taper is for, to take care of that irregularity.”

Continuing, the witness says that the tube sections are not always of the same length, but that the taper offers compensation for the variation in the end of the sections. Furthermore, witness admits that when the tube is removed for repair he has occasionally found the interior diameter of the tube that slips over the taper varying at times and on recross admits (R. 612):

“XQ. Every time that you slip a tube over its hub section and remove and put it back, each time the part changes its relative diameter?

“A. Yes.”

The reason for reaming inside of the ends of the tube sections is stated by Mr. Conant on cross-examination (R. 689-690):

"That is done because the tube that is used is standard pipe, which is not circular, and varies considerably in diameter, both inside and out.

"XQ. Why do you have any taper at all, then?

"A. We have cut that taper down to the minimum which will insure keeping the tube from rattling. . . .

"There is no need of putting a tube on there at all, unless you keep it somewhere near position."

*Vibration tends to loosen the joints and promote leakage.*

Continuing under cross-examination, Mr. Conant testified (R. 691):

"The rattle is caused by vibration. Vibration will break bearings out of the hub if it comes from the shaft, or the tube, or anything else in connection with a highly rotating speed shaft. . . .

"Vibration originates with the shaft, anything around it that is loose will vibrate with it. . . .

"As far as I know, it is not physically possible to get a shaft of the length of the commercial product which will not vibrate at that speed.

"If the tube would rattle, its own action would enlarge that to such an extent that it would have to be taken out. . . .

"I don't know of a pump where the shaft will be perfectly quiet. . . . Your entire tube line is supporting the individual sections. The supports for the bearings are on webs. If you get something that is of the weight of the tube and it will bounce around and rattle in there, it has the possibility of breaking that bearing, and entirely breaking the webs."

## FACTORS OF SPEED, WEIGHT, ETC.

The usual operating speed of a Western Well Works pump shaft is 1150 revolutions per minute (R. 697).

*Length of Tube Sections:*—The tube sections in a Western Well Works pump are each 6 ft.  $3\frac{31}{32}$  inches long or approximately 6 ft. 4 in. (R. 697).

*Weight of Tube Sections:*—The weight varies with the diameter. A  $2\frac{1}{2}$ -inch tube 6 feet 4 inches long weighs approximately 6 pounds to the foot. A 3-inch tubing weighs 8 pounds to the foot. A  $3\frac{1}{2}$ -inch tubing weighs between 9 and 10 pounds to the foot (R. 700). Thus a  $2\frac{1}{2}$ -inch tube would weigh approximately 30 pounds; a 3-inch tube approximately 50 pounds; and a  $3\frac{1}{2}$ -inch tube would weigh between 55 and 60 pounds. (We understand the Anderson pump is a 3-inch tube.) And assuming lengths of 3-inch tubing as having a pump approximately 140 feet below the surface, making allowances for the combination couplings, 20 lengths of 3-inch tube would be approximately 127 feet in length of tube sections. These sections weighing eight pounds a foot would give us a *total weight of 1316 pounds of tubing alone or considerably more than half a ton!* With 20 lengths there would be 40 slip-joints and with 1300 pounds and 40 joints and a rapidly rotating shaft, it is fairly reasonably certain that all joints are not going to be airtight or watertight!

With the foregoing practical considerations in view and keeping in mind Mr. Conant's observations quoted above from his cross-examination, and particularly his statement:

"As far as I know it is not physically possible to get a shaft of the length of the commercial product which will not vibrate at that speed."

We find practically all of the witnesses in accord with Mr. Conant that vibration is the rule rather than the exception. Thus Mr. Folsom for plaintiff was asked on cross-examination (R. 619) if there is ever any motion, due to the shaft, between the telescoping parts and answered, "I cannot say there was, unless the pump was vibrating."

Mr. Nielsen (R. 661) states that his pump is installed in a crooked well and that "the vibration of the shaft knocked out the same boxing" (meaning the bearings).

Mr. Bradford, whose experience is certainly entitled to weight, says (R. 715):

"The shaft vibration would tend to keep the tube line from making a permanent seal over the hub of the combination coupling."

and that the result of so keeping the seal open

"would allow a small quantity of water to pass through and into the tube line on certain joints. . . .

"It would come from between the discharge column and the casing, itself."

If further evidence was necessary to show that the vibration would keep these bearings open we have only to refer to Prof. Lesley (R. 759):

“The effect of a rapidly rotating shaft, provided the bearings are sufficiently spaced, is to produce vibration. Very few shafts are accurately balanced. The effect of vibration upon any shaft would be to keep it loose.”

And, again (R. 761):

“Vibration with parts weighing what these parts do would necessarily in time jar, wear them loose, which is unavoidable, and that would in time permit greater freedom, or would allow water to enter with greater freedom. That is obvious.”

And (R. 762):

“Q. Have you observed whether there was any vibration of the columns that you were testing out?

“A. Yes, there was not only vibration in these two instances, but there was what may be termed gyrations; of course, the whole assembly is hung from the top of the well, and the whole column gyrates in those two instances, very slowly; not at the rate of rotation of the pump shaft, but a slight gyratory movement, weaving of it; that was very apparent; you could see it moving, weaving around.”

And Mr. Doble, Sr., plaintiff's expert, admits (R. 857) that vibratory action takes place in pumps of this character with regard to the shaft when in rotation if the impeller is not balanced, and that this vibration caused at the lower end “will be transmitted through the entire structure.”

TIGHT TUBES THE RULE WITH GETTY AND OTHER  
NON-INFRINGERS.

It is evident from a reading of the opinion of Judge Dietrich that he was misled by the views and unsound arguments of the plaintiff and laid unnecessary stress on the character of the joints formed by defendants' shaft tubing. He overlooked the fact that the use by the Western Well Works of unthreaded tube sections and telescoping hubs, whether the latter were cylindrical, as in the Halstead patent, or tapered, as in practice, was really of no more consequence, as far as the construction of the Layne claims was concerned, than if the tube sections were screw-threaded together.

In the Getty case, and again in the Los Angeles case, the protecting tubing joints were tight. They were screw-threaded and we presume they were water-tight. Screw-threading or bolting together by flanges is the usual method of connecting tubing or pipe sections together. The difficulty of assembly that would result by the peculiar hub construction of defendants in case they tried to have their pump casing and shaft-protecting tubing both screw-threaded, should be self-evident. In other words, you could turn up an outside pipe onto the threads of a connecting member but you would not be sure that you could at the same time be screwing up an inner threaded portion of that member into an inner screw-threaded tube section; hence the plan adopted by the defendants of *screwing their discharge casing section onto the spider and having*



the hub, which is carried by the spider, tapered so as to *slip* into the inner shaft-protecting tube.

Usually where the inner tube is screw-threaded the outer discharge casing is not designed to be coupled by a turning or screw-thread movement, but is provided with a flange which is bolted to an adjacent flange section, after the usual manner of connecting lengths of pipe other than by screw-threads. Inasmuch as in defendants' device each tube section rests at its lower end on an upwardly projecting, tapered hub, it is manifest that the harder or tighter a tube section seats down on its lower seat just that much it draws away from its upper seat.

Mr. Conant indicates (R. 667) that the tube sections of defendants' pump are not only loose but they are *shorter* than the distance between the hub shoulders, so that the tubes could never seat at both ends at once.

"There is no weight taken on the tubing connection on the tubing itself, for the reason that tube lengths, as I stated before are  $1/32$ d of an inch shorter than the discharge column lengths. The face on the bearing hub, which the tube would have to seat on, is exactly the same distance as the seat for the discharge column. Since the tube is shorter than the discharge column, the tube never seats on both ends at the same time. In some installations, it might seat on one end, and in the next installation seat on the other. It is purposely made shorter, so that the discharge column seats and the tube does not. Therefore, it cannot carry any weight but its own individual weight."

**LUBRICATION IN DEFENDANTS' STRUCTURE.**

When a new pump of defendants is installed a certain amount of heavy grease is smeared in around the bearings to wear them down smooth; this grease being put in only at first and in a new pump and in addition to the emulsifying oil admitted at the top continually and by which lubrication is maintained.

That lubrication is of prime importance and that lubrication is not entirely confined to liquid oils, we have only to refer to the Byron Jackson correspondence supra. Thus Byron Jackson writes to Professor Mead, under date of May 5th, 1903 (R. 116-117) concerning a method of oiling that he had in mind whereby he would oil "either with a light soft grease or with a light liquid oil;" and again at R. 141, in his letter of September 5th, 1903, to Professor Mead, Jackson wrote:

"... the only thing that I can do is to specify the method of oiling and as I do not know how much oil mixed with the water would make it unsuitable for brewing purposes, the only thing I can know about it is that it is necessary that some oil should be supplied to make the bearings reasonably durable. The amount of oil used will depend somewhat on the attention given it, making the feeding constant and uniform and not intermittent."

Then again in his letter of October 7th, 1903, to Mead he says:

"Yet I should recommend however a free use of oil in the start and then after it has proved to be running successfully with oil, then the oil may be cut down to a limited supply so

that it will not injure the water for their use but I very strongly recommend a liberal supply at first as you may understand, the pipes that convey the oil have got to have a surplus there to get the oil started and after they are once lubricated and worn a little free then I think there will be no danger of damage to the bearings even if the oil supply is limited."

Thus he stressed the necessity of having excessive rather than too meager lubrication when the pump was new. Apparently, it made no difference whether he used liquid oil or grease. Grease, of course, becomes liquid under stirring and heat generated by frictional rotation.

The use of grease and the length of time it would stay inside the casing was another false issue which was injected into the case, and defendants' counsel again voluntarily conceded that "some of the heavy grease is splashed around there, and some of it is going to stay in the tube and some of it on the shaft" (R. 794). Undoubtedly heavy grease placed within an enclosure of this kind will remain for a considerable time, but its lubricating value is very short lived. It quickly becomes dissipated, and especially in a structure of this kind the high speed rotating shaft will act by centrifugal force to throw the grease against the inside walls of the casing. Obviously no sensible person is going to rely entirely upon heavy grease for indefinite periods to lubricate these bearings, nor is any user or manufacturer going to go to the expense of withdrawing one of these large and heavy pumps every few

months for the purpose of replenishing the grease. There is plenty of testimony on behalf of defendants' witnesses to show that *this grease is put in for the sole purpose of working in new bearings*. Thereafter lubrication of these bearings is done entirely by circulatory system which feeds oil in at the top bearing at the rate of several drops per minute, and according to the admission of plaintiff, this oil subsequently comes out through the drain tubes in the bottom of the casing.

Nevertheless we see an effort now by plaintiff, in spite of his admissions in brief and evidence that defendants' lubricating system is "circulatory," to show it is at the same time "stagnant."

How can defendants' lubricating system be both "circulatory" and "stagnant." Yet plaintiff says in its brief, of defendants' pump (p. 103):

"Lubricant, with the exception of the hard grease packed in the shaft casing by defendants at the time of installing the structure, is fed into the top of the shaft enclosing casing at 12 and passes or circulates down the casing through each intermediate bearing and through the lowest bearing into the chamber 27 from which it overflows and passes through the conduits 28 into the well."

And then on page 124:

"According to the stipulations and admission of defendants' counsel, a '*stagnant*' method of lubrication is employed in defendants' apparatus, so the charge of infringement cannot be avoided on the ground of the absence of same." (Italics theirs.)

This is obviously untrue. Defendants' counsel never did nor could he stipulate anything of the sort so contrary to the evidence.

But on page 136 they say:

"However, there is no similarity between the Getty so-called circulatory system and the defendants' '*stagnant*' system in which the heavy lubricants remain in the casing for years. Also, the mere fact that some of the emulsifying oil and possibly some of the heavy grease, passes out of the bottom of the defendants' casing is immaterial." (*Italics theirs.*)

And then, on the other hand, when plaintiff considers the Layne patent it again blows hot and cold in seeking to escape from the finding in the Getty case that Layne is "stagnant" and trying to show that Layne is now "circulatory."

Advocacy quite outruns itself.

If the use of "grease" as distinguished from "oil" should impress the court as important then this is what the testimony shows as to the use of grease and oil by defendants:

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**LUBRICATION IN THE WESTERN WELL WORKS PUMP.**

Mr. Layne's testimony on the circulating system of defendants has already been quoted. Defendants' lubrication is of two kinds: (a) lubrication of a new pump when it is first started; and, (b) lubrication for general operation.

(a) Mr. Conant says (R. 696), in speaking of the grease that is first put in:

"The grease is put there in order to wear in the bearings. Our bearings are cast iron. The grease is put there, particularly the graphite grease, to form a film on the bearing which will prevent further action of the shaft on the bearing. This grease is only put in there for a temporary purpose; the fact that oil is fed from the surface by means of a drip cup—for instance, if you had a 100 or a 150-foot pump, or more, you have several bearings in there; the oil going to the first bearing would take care of that, but by the time the oil got to the bottom bearing, if there was no provision for grease at each bearing, they might be scoured or burned before the oil ever reached there. By providing grease, it does not run out while the pump is being assembled, the grease remains and passes through the bearing when the pump is started up. . . .

"The grease which passes through the bearings and which lubricates the bearings, for which purpose it is put there, passes out the drain tubes." (R. 697.)

Mr. Bradford says (R. 713):

"At the time the pump is started, we have grease at all the bearings as they are installed; nevertheless, for the first day or two we run in what would be an excessive quantity of oil to properly work in the bearings, later cutting that down to perhaps 10 ounces in twelve hours or twenty-four hours."

Mr. Bradford as a practical installer says (R. 721) that when new pumps are first assembled they first put a quantity of graphite grease just *above* the bearings on the shaft and then smear on a quan-

tity of No. 5 standard cup grease and above that pour perhaps half of a tomato can full of oil at *every fourth joint*. (Every fourth joint would be approximately 25 to 30 feet apart.)

Prof. Lesley describes the installation he observed (R. 749, 750):

*“ . . . the discharge column, including the combination coupling, the tube joint and the shaft were all new, had evidently, from their appearance, never seen any service at all, bright, new castings, merely painted on the exterior. I watched this assembly. The tube line joint instead of being loose, comparatively loose, as in the first installation, was on the whole comparatively tight. I saw an occasional one that would sink almost to the shoulder, perhaps within an eighth of an inch of the shoulder, before it would support its own weight. White lead was also used upon the joints. A small amount of graphite grease was placed above each bearing, perhaps what I could put on the end of my finger; above that, after the tube was put into place, was placed a small quantity, I should guess a quarter of a pint of oil, poured into the top of the tube—heavy duty Zerolene.”* (Italics ours.)

At (R. 629) Folsom describes the use of grease as distinct from lubricating oil in the assembly of a new pump employing three-inch tubing and where the length of the tube sections and the distance between the bearings were as he said 6 feet 8 inches (probably 6 feet 4 inches):

“We usually only packed the grease around the shaft before we slipped the tube down; we used, generally, about 30 inches on a tube, all

we could make stick on, adhere to the shaft, and then we slipped the tube over."

This lubrication was "at the bottom of each section of the shaft. . . . The shaft was already in the bearing."

That this heavy grease is subsequently expelled through the drain tubes, except such as is thrown out by centrifugal action of the shaft and is naturally smeared over the interior of the tube is conclusively shown by Mr. Bradford's testimony (R. 715):

"A. On removing certain installations that were made this spring the grease had been forced out of the drain tube, and as the pump bowls were brought from the well this grease, in the form that it came from the drain tubes, was on top of the bowl.

"Q. Outside of the pump proper?

"A. Laying on the outside of the pump column.

"Q. What was the condition of the pump at the time you saw the milky fluid in the pump installed in the pit? Was the pump working?

"A. The pump was running.

"Q. How long had it been running, do you know?

"A. Two or three years.

"Q. Will you please state what effect, if any, the rotating shaft of a Western Well Works pump will have on the bearings, or on the tube section, and the connections with the bearings of the hubs?

"A. The rotated shaft, working against the spiral of the bearings in the combination coupling, exerts a certain amount of power and tends to drive and force downward the lubri-



cant that is inside of the tube line. The shaft vibration would tend to keep the tube line from making a permanent seal over the hub of the combination coupling.

"Q. And the result of that keeping that seal open would be what?

"A. Would allow a small quantity of water to pass through and into the tube line on certain joints."

Prof. Lesley showed by his demonstration on the Conant pump installation according to standard practice that no matter what was in the tube line in the way of lubricant, whether emulsifying oil, "Zerolene" or "Artic" cup grease, the same passed through the pump and out the drain tubes, the best proof of which is seen by the bottled samples (Defendants' Exhibits Y1-Y10, inclusive (R. 745-757.)

Mr. Doble, Jr., called as an expert for plaintiff, found that there was some sort of a downward circulation of the liquid in the pump when the Western Well Works pump was pulled a few feet up in the well (R. 809-812), and admits (R. 814), that there was a clearance between the grease-lined interior of the shaft-tubing and the shaft.

The same witness, after reluctantly admitting that there was a clearance, further was bound to admit (R. 817) that in each bearing the lubricant would perform its function and in turn would be driven downward by the combined action of the rotating shaft and the helical groove. He also admits (R. 817) that the shaft rotating from 1100 to 1200 revolutions per minute would "tend" to throw the lubri-

cant off by centrifugal action and that that offered a "partial" explanation of the accumulation of the oil or grease that he saw on the interior of the tube.

And finally this (R. 819):

"XQ. Now, Mr. Doble, if water would flow down the tube line, wouldn't oil flow down the tube line, too?

"A. I couldn't see where that water was.

"XQ. Please answer my question.

"A. It would.

"XQ. That is, it would find exit at the same place as the oil, would it not?

"A. Presumably it would.

"XQ. And if that exit was at the drain tubes, No. 28 in model V, the oil would find the same outlet, would it not?

"A. Presumably it would.

"Mr. TOWNSEND. That is all."

Mr. Doble, Sr., admits (R. 822) the helical groove will act as a force feed for any grease in the tube. Prof. Lesley has shown (R. 880) that the helical groove develops in practice a tremendous pressure (60 lbs. per sq. in.), with the direction of discharge downward. It is obvious that if the helical groove will develop "pressure" it will produce circulation. If, then, the grease is moved through each bearing by the helical groove it will eventually reach the drain tubes and be expelled. The evidence all shows this to be an actual fact.

In the face of the foregoing we are unable to see how the trial court in its opinion (R. 895) came to lay such stress on the use of hard grease where he found:

“ . . . the shaft casing is made impervious to water and it is packed for a considerable distance above and below each bearing with a hard immobile grease, the only possible function of which can be to prevent the ingress of water.”

The above is wholly at variance with the true facts as we have seen.

Interesting as the speculations are of the witnesses for plaintiff, they ought not to outweigh the practical experience testimony of men like Conant, Vaughan, Halstead and Prof. Lesley.

If the question is to be decided upon the testimony of the experts, disagreeing as they do, preference should be given to that testimony which is based on practical experience in connection with the matter directly in controversy rather than to plaintiff's experts who show and admit they have had no practical experience with pumps of this character. (Kimball vs. Waters Co., 177 Fed. 239, 244.)

“Doubts are expressed by the expert called by the complainant, whether the device can be made in that way, but the proofs introduced by the respondents are entitled to greater weight than the opinion of any expert, as the question is one which can be demonstrated by practical operation and experiment.” (Hudson vs. Draper, 4 Fisher 256, Clifford, J.)

See also Norton vs. Jensen, 49 Fed. 859, 864.

Infringement, which is a tort, cannot be established by evidence which is speculative in its character, and this is especially true where a witness

who attempts to testify as an expert does not possess the qualifications of an expert.

National Machine Corp., Inc. vs. Benthall Mach. Co., Inc., 241 Fed. 72.

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**(b) SUBSEQUENT LUBRICATION IN WESTERN WELL PUMP.**

Mr. Vaughan says (R. 783-784):

“We use an emulsifying oil for the reason, first, that in its pure state it is a good lubricant, and mixed with a sufficient quantity of water it is still a good lubricant. Second, by reason of the fact that after the pump is shut down, the water in our pump comes back on the inside of the column line, to the static head of the water in the well, and it forms a milky coating over the bearings and the shafting, and the inside of the tube, and prevents rust action. It is very essential that this be done wherever possible, for the reason that as soon as a piece of metal, or steel, or cast iron is exposed to water, especially in an inoperative form, it commences to oxidize, and immediately when starting up the pump the portion that is in the bearing will throw off the rust particles and cause them to cut and wear the shaft and bearing.”

The helical groove assists, as we have seen, in the downward flow and in the circulation of the lubricating medium.

Mr. Folsom, plaintiff's witness, says (R. 622):

That an emulsifying oil was used “so that it would mix with the water when it came in contact with any water. . . . Wherever the water happened to be down in the tube line. . . . At some

point where the emulsifying oil came in contact with the water."

And at (R. 623) when they pulled the pump "the oil ran out at the bottom of the tube . . . whatever lubricant was used."

Mr. Bradford says (R. 713):

"We use a vegetable emulsifying oil. . . .

"That is applied with a sight feed, gravity drop oil cup, feeding at some point or points inside of the tube line, with the drip or moisture that is forced around the ends of the tubes, and runs out at the drain tubes in a white or emulsified form."

Mr. Bradford had an opportunity to observe this discharge from the drain tubes on an occasion where he says (R. 714):

"This pump was installed in a pit, and it was possible, by going down the pit, to observe the lubricant running from the drain pipe, with about ten feet of lamp cord below the bottom of the pit. . . .

"The tubes were dripping a small quantity of white fluid, *probably at the rate of one or two gallons a minute.*" (Italics ours.)

(Note how this quantity discharge compares with Prof. Lesley's test on the Conant ranch.)

In these tests by Prof. Lesley the discharge varied slightly according to the pressure or head pumped against. Thus (R. 747):

"Under free discharge at the top, with a 79-foot head upon the top pump bowl, a gallon in 1.15 minutes. . . ."

With eight pounds pressure equivalent to pumping head of approximately 18 feet ( $8 \times 2.31$ ) the discharge was a gallon in 1.01 minutes; with 16 pounds pressure a gallon in 0.92 minutes; with 26 pounds pressure a gallon in 0.79 minutes. That was with the old pump.

With the new pump in his tests Prof. Lesley found the rate of discharge (R. 755) with free pump discharge as one gallon in 2 minutes and 40 seconds; this discharge being represented by bottle No. 9.

*It is thus apparent that Prof. Lesley's operating conditions were not dissimilar from those found by Mr. Bradford (R. 715, supra) in this old installation which was in operation.*

As a matter of fact Professor Lesley's tests were on a regular stock pump of defendants.

The installation was special only to the extent it was put in a pit or open well so a man could go down to the bottom and observe the pump operating and the action of the drain tubes. A man can by no means go down to the bottom of a bored well.

Manifestly, a rapidly rotating shaft would provide at least as much clearance between itself and any grease around it as is provided between a shaft and a bearing through which it passes. As a matter of fact we know, just as the witness Doble admits to be the case (R. 819), that a rapidly turning shaft would throw the grease off by centrifugal action

and thus open up a space between it and the grease for the oil to pass down through. In addition to that, the spiral grooves are acting at all times like a spiral conveyor by force feed to feed the grease and oil downward.

In addition to this we have seen that the various witnesses—Bradford, Conant and Prof. Lesley—all observed the discharged grease from the drain tubes. Their testimony and the samples of bottled lubricant before the court collected at the time of the Lesley tests are uncontrovertible proofs of circulation; this in addition to the admissions of Layne and his counsel.

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**THE USE OF GREASE AS A LUBRICANT NOT CONFINED TO  
WESTERN WELL WORKS CONSTRUCTION.**

By reference to the opinion of Master in Chancery Helm in the Los Angeles case beginning at R. 1100 the court will see that Judge Helm in finding the changed construction of the defendants' device there as not being infringed, nevertheless excluded the sand and detritus, and the pump of defendant there, which the Master inspected, *showed the use of a large amount of grease*. We quote from that portion of the opinion (R. 1100-1):

"I find that it is true that no water, or sand or detritus was in the enclosing casing or in the bearings and that there was no sand or detritus in the inside of said enclosing casing above the pump neck; *that upon the erection of said pump there was a large amount of grease in-*

*serted in said casing but that it had become worn and was escaping from just below the long brass sleeve which is located in the pump neck. That said long sleeve bearing in said pump is made of brass and was eight inches in length, but said long sleeve bearing does not effect the entire closing of the pump shaft with the enclosing case from water or sand to detritus from the well, from the discharge pipe and from the pump proper in combination with a lubricant as contained therein or in the same manner set forth in said Layne patent, and does not in fact effect any closure of said pump as it is open and the oil and lubricant are free to move therein without obstruction.*

*"I, therefore, find that said defendants have not constructed said pump at the Hart ranch, or otherwise or at any place, since January 23, 1920, in violation of said restraining order or infringement of the said Layne patent." (Italics ours.)*

We thus find both in the Getty case and in the Los Angeles case that there was circulation and escape of lubricant, notwithstanding that in both cases there the defendant used a long sleeve bearing with only the usual clearing ( $1/64$ ) of an inch provided for the shaft; and in the Los Angeles case defendant used heavy grease as well as oil, while *in the Western Well Works' case the conduits 28 not only are of substantial area but provide unrestricted communication for gravity flow from the inside of the oil tube into the open space in the well entirely outside the pump and uninfluenced by any action going on within the pump except such leakage as there may be from the discharge column into*



the oil tube to form an emulsion which practice shows is being formed at all times.

It is extremely difficult to follow plaintiff's argument in regard to an alleged employment of a "stuffing box" in defendants' pump. A stuffing box is defined in the Century Dictionary and Cyclopaedia as "a contrivance for securing a steam, air or water-tight joint." After admitting that water will pass freely between the shaft and lower portion of defendants' bottom bearing, plaintiff says that this same part "operates as a stuffing box." When plaintiff finds it necessary to concede antitheses in order to argue equivalency, their case is indeed desperate.

The trial court said (R. 895):

"If, as I have been constrained to find, in the defendants' actual installations, the shaft casing is made impervious to water and it is packed for a considerable distance above and below each bearing with a hard, immobile grease, the only possible function of which can be to prevent the ingress of water, to impede the progress of the lubricating oil, and itself to serve as a lubricant, it must be held that the term 'circulatory lubricating system' is a misnomer, and that the difference in that respect between the two systems is colorable only."

Grease could not prevent the ingress of water unless the tube were entirely filled with it so that no volume were available.

There was in the evidence presented no statement that grease was placed *below* each bearing in in-

stallation. This would be impracticable and is not done.

Grease could not impede the flow of lubricating oil. Although in each new installation it is packed around the shaft for some distance *above* the bearing, the rotation of the shaft would throw it off and leave a free channel quite as large as that through the bearings.

The trial court appeared to have utterly neglected the evidence as to the action of the helical oil grooves.

*Layne and his counsel, as we have seen, admit that defendants have a circulatory system and that the lubricant goes down from bearing to bearing and then out the end of the shaft enclosing casing and out the ducts at the bottom into the well.*

We accept plaintiff's view of the situation and submit that this in itself is proof conclusive of the *circulatory system of lubrication employed by defendant* in this case and bringing it within the Getty case. All other evidence in the case, including the aniline dye test by Prof. Lesley, only goes to corroborate and sustain defendants' view that the defendants' system of lubrication being a *circulatory system*, and the plaintiff's patent being a *stagnant system*, there is no infringement.

Finally, the trial court in its conclusion sweeps within the embrace of plaintiff's patent any system of lubrication that may be considered "practical

and efficient," thereby contravening the rule so oft laid down that you cannot patent a principle or function, or, as the court said in the Getty case:

"The Layne patent must rest not upon the idea of closure which would not be patentable, apart from the method by which it was accomplished, but on the *means of its accomplishment*, as disclosed in the specifications."

That all lubricating systems are not equivalent is shown by plaintiff's expert, W. A. Doble, Sr., in connection with an objection to Eisler being considered an equivalent of Layne: There Mr. Doble said (R. 842):

"XQ. You pointed out that that was an objection to this method of lubrication in Eisler by using these pipes, the fact that some bearings would get more than others?

"A. A material difference in the system is that that is a series lubrication and this is a parallel lubrication."

Surely there is less difference between Layne and Eisler than there is between Layne and Halstead.

This court has frequently said that where there is a difference in function, or difference in mode of operation, or difference in principle of construction, or variation in means between two machines or devices, even though they produce the same result, there is no infringement.

"In *Burr v. Duryee*, 1 Wall. 531, 572 (17 L. Ed. 650), the court said:

"That two machines produce the same effect will not justify the assertion that they are sub-

stantially the same, or that the devices used by one are therefore mere equivalents for those of the other. . . . An infringement involves substantial identity, whether that identity be described by the terms "same principle," same "modus operandi," or any other. It is a copy of the thing described in the specification of the patentee, either without variation or with such variations as are consistent with its being in substance the same thing. If the invention of the patentee be a machine, it will be infringed by a machine which incorporates in its structure and operation the substance of the invention; that is, by an arrangement of mechanism which performs the same service or produces the same effect in the same way.'

"And in *Westinghouse v. Boyden Power Brake Co.*, 170 U. S. 537, 569, 18 Sup. Ct. 707, 723 (42 L. Ed. 1136), the court said:

" 'But, after all, even if the patent for a machine be a pioneer, the alleged infringer must have done something more than reach the same result. He must have reached it by substantially the same or similar means, or the rule that the function of a machine cannot be patented is of no practical value. To say that the patentee of a pioneer invention for a new mechanism is entitled to every mechanical device which produces the same result is to hold, in other language, that he is entitled to patent his function.' "

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**CIRCULATION AIDED BY DEFENDANTS' HELICAL GROOVE BEARINGS.**

"Circulation" in the Western Well pump is accentuated by the use of the spiral, or rather helical-groove-feed bearings.

Plaintiff's witness Folsom says (R. 622) that the defendants lubricated "by a drop oiler from the top. . . . Gravity feed," and that the function of the spiral grooved bearings "was to conduct that lubrication down the shaft."

One of these "spiral" (or more properly speaking) *helically grooved bearings* is in evidence as defendants' Exhibit "C." Conant says this spiral or helical groove in the bearing is for the purpose of *assisting the downward flow* of the oil from bearing to bearing. In other words "circulation" in the Western Well Works pump is *speeded* and *accentuated* by the use of a spiral groove.

Mr. Doble, Sr., at R. 822, while admitting that the oil or grease will be fed down, attributes an additional function to it in assisting in the lubrication of the bearing surface, Mr. Doble observing:

"If the groove becomes stopped up so that it would not function sufficiently, the bearing would become dry, but, due to the rotation of the shaft, and this helical groove, the rotation of the shaft gradually draws the grease out of that groove and distributes it over the surface of the bearing; but its real function is to prevent too rapid a flow of grease through it. If you had a vertical groove, the flow would be too rapid; but by the helical groove, the distribution is much more complete; it serves the purpose of preventing too rapid a feed of the lubricant."

This testimony of Doble is to be viewed in two aspects: (1) as confirming what all the other witnesses say about the groove that it carries the lubri-

cant downward; and (2) as showing how poorly qualified the witness is as an expert on this subject because Prof. Lesley, by his interesting tests and explanations to the court on surrebuttal, confirms the down flow statement of Mr. Doble but directly refutes Mr. Doble's further speculation on the objects and intentions of the defendants in using the groove; Prof. Lesley saying (R. 879-8):

“Under my directions we constructed a bearing structure involving a single bearing, provided within a thousandth of an inch—within such dimensions as are possible with reamers—with the same diameter as the standard bearing for a  $1\frac{1}{4}$  shaft.

“Q. Provided with the same pitch of helical groove?

“A. Provided with the same pitch of helical groove, and same diameter of shaft supplied, and support for the bearing, so that there would be no thrust upon one side, so that it would be simply hanging vertically within the bearing, and arranged to rotate it at various speeds. We determined, first of all, the pump action of the spiral bearing. Mr. Doble, by the way, is entirely correct, that it should be called a helical groove; I have simply adopted the term ‘spiral,’ because that is the term the Western Well Works have used. The action of this helical groove is to conduct lubricant downward, since the groove is downward in the direction of rotation—conducting it downward with considerable rapidity and with astonishing force. I used a number of lubricants. I used water alone. Water would be conducted downward with the ordinary speed of rotation of about 1100 revolutions per minute, with approximately a pound pressure per square inch—would maintain a pound pressure per square inch. A mixture of water and emulsifying oil

would be conducted downward with greater pressure, maintaining a higher column of lubricant. The pressure developed, the downward pressure developed by the lubricant itself passing through that helical groove, appeared dependent upon the quantity of oil, upon the viscosity of the fluid. With the pure lubricant, itself, the pure oil, itself, it developed pressure of 60 pounds per square inch, with a single bearing operated at normal speed, normal clearance of the bearing, and a normal size oil groove."

The number of these helical groove bearings increases the downflow, as Prof. Lesley adds:

"If the tube were full, of course a series of bearings would act as a multistage pump, one bearing would develop some pressure, on the next one further pressure, and so on."

And (R. 883):

"I would like to say to the Court that the action surprised me, I did not myself believe that it could be so considerably different."

(The apparatus by which these tests were made is in evidence as Defendants' Exhibit "Z.")

*So fast was this feed*, Prof. Lesley says (R. 885) that in feeding the fluid to the grooved bearing of Exhibit "Z":

"I poured it in in a fair stream, I should say perhaps a pint, in two or three minutes."

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#### THE THEORY OF THE HELICAL OIL GROOVE.

When two surfaces with a viscous fluid between them are moved relatively to each other, the fluid

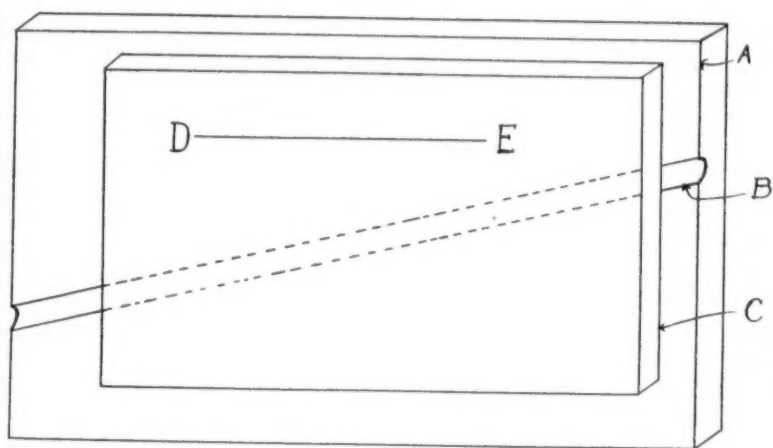


Fig 1.





tends to adhere to each surface and is consequently spread. If one of the surfaces is provided with a groove the groove will become filled with the fluid. If the groove in the one surface is oblique to the direction of motion of the other or, putting it in another way, if the direction of motion of the smooth surface has a component in the direction of the groove, the fluid contained in the groove will be moved along it.

To illustrate, in the accompanying Figure 1 let A represent a surface provided with a groove B and C another surface which moves relatively to A in the direction ED. The direction ED has a component in the direction of the groove B. A lubricant or a viscous fluid which is between the two surfaces and which fills the grooves will, by the motion of the surface C in the direction ED, be carried along the groove. It is obvious that it will make no difference which surface is stationary relative to the earth or which moves. It appears that the quantity of lubricant that would be moved along the groove in a given time should vary with the relative velocity of the two surfaces.

It is obvious that the form of the surfaces is of no consequence. The action would be the same with cylindrical as with plane surfaces. Therefore it appears clear that a bearing such as used for the line shaft of the pump manufactured by the Western

Well Works, Inc., will, with respect to feeding lubricant through it, function in the following manner.

It is first to be noted that these bearings are provided with helical oil grooves and that the helix is downward in a counter clockwise direction, viewed from above, which corresponds to the direction of rotation of the shaft.

Lubricant fed to the top of such a bearing will be carried downward through it by the combined action of the helical groove and the rotating shaft.

Provided that sufficient lubricant is supplied to keep the groove full, the amount that passes through will vary with the rotative speed of the shaft.

While the more viscous fluids will pass through the bearing with less rapidity than the less viscous ones, since the action of gravity upon them will be less effective in causing flow, it appears that for the part of the flow which is due to the combined action of the helical groove and the rotating shaft there should be comparatively little difference between fluids of various viscosities.

The lubricant is fed through the bearing by the combined action of the helical groove and the rotating shaft. It seems obvious that a helical groove would convey a lubricant more readily than a straight one in an axial direction, it

being common practice to provide such grooves for that purpose on bearings of all sorts.

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**JUDGE MORROW'S OPINION.**

Judge Morrow, speaking for the majority of the Court of Appeals for the Ninth Circuit at R. 1125-1126 analyzes the three claims in suit into their constituent elements. Later he calls attention to the cardinal rule so often recognized by this court that the claims of a patent are the measure of the monopoly granted, citing *Keystone Bridge Co. v. Phoenix Iron Co.*, 95 U. S. 274, where the Supreme Court of the United States says, on page 278:

“But the Courts have no right to enlarge a patent beyond the scope of its claim as allowed by the Patent Office. . . . When the terms of a claim in a patent are clear and distinct (as they always should be), the patentee, in a suit brought on the patent is bound by it. *Merrill v. Yeomans*, 94 U. S. 568. He can claim nothing beyond it. But the defendant may at all times, under proper pleadings, resort to prior use and the general history of the art to assail the validity of a patent or to restrain its construction. The door is then opened to the plaintiff to resort to the same kind of evidence in rebuttal; but he can never go beyond his claim. As patents are procured ex parte, the public is not bound by them, but the patentees are. And the latter cannot show that their invention is broader than the terms of their claim; or, if broader, they must be held to have surrendered the surplus to the public.”

In connection with the elemental structure of the claims the Appellate Court calls attention to the

fact that the element specified as the "rotary pump" of claim 9 is the "pump" of claim 13 and the "rotary pump" of claim 20; these different designations of the same element having in each case the same identical function and the approved form of the "pump" used by the inventor being a centrifugal pump.

Next the court finds that the element specified as "jointed pump shaft" of claim 9 is the "actuating shaft" of claim 13 and the "line shaft" of claim 20; this shaft in each instance performing the same function and described in the specification as "attached together by means of sliding keys so as to allow of some vertical play with relation to each other".

The court finds that the next specified element of claim 9, i. e., the "closed casing surrounding the pump shaft" is the same as the "sectional casing" of claim 13 and as the "well casing" of claim 20 by which the shaft is "entirely closed off from the water in the well".

The Court of Appeals in the Van Ness case (213 Fed. 804, 807) held that claims 9 and 20 were substantially alike and saying:

"The word 'closed' in claim 9 seems to mean as much as the words 'entirely closed' in claim 20. . . .

"It seems quite clear that the idea of a protected casing for a pump shaft without restrictive interpretation would contain no novelty and would not be patentable, and, if this ele-

ment in the patent is given the unrestricted meaning that its language admits of, it would destroy the claim."

In connection with claim 13 the Appellate Court for the Ninth Circuit further calls attention to the additional elements of "a fixed block" with "bearings for the shaft" and the fact that the casing is "closed at the top and provided with an air vent".

The court in answer to the plaintiffs' plea that these claims must be read as possessing three functions, that is, namely:

- (1) Protection to the shaft bearings;
- (2) Lubrication;
- (3) Shaft alignment (R. 1128),

quite properly points out not only that *these claims do not set out the alleged triple function*, but they do not even specify the *means* for accomplishing such a function. The court quite correctly pointed out that the patent specification of Layne includes two specified functions: (1) the function of protection to the bearings by closing off the bearings from the water and sand pumped to the surface and (2) enclosing the bearings to provide for lubrication; but, says the court:

"Further than this the specification does not go."

As to the "plumb bob" theory of the plaintiff the court rightfully calls attention to the fact that nothing is found for any such attribute of the Layne

pump in claims 9, 13 or 20; that the nearest approach to claiming such an idea is in *claim 18* where the word "suspending" is used. Claim 18, however, it is to be noted, provides, as do so many of the claims for "fixing" the pump "at any desired point in the well casing, and means for operating the fixing devices from the top of the well."

Judge Morrow called attention to the fact that claim 7 calls for a series of wedges suspended by rods and that in claim 8 these wedges are mounted upon toggle links and in answer to the claim that this device enters into the mechanism of the shaft casing and also has the function of alignment of the shaft Judge Morrow properly says:

"There is no charge that either claim 7 or claim 8 has been infringed by the defendants, and it appears from the testimony that this device has been abandoned by the plaintiff and is no longer a part of the mechanism in actual use."

Continuing the court says (R. 1130):

"It seems clear to us that the alignment is not a function of the shaft casing, but is a function of the means used for suspending the apparatus from the top of the well, combined with the law of gravity." . . .

We, therefore, opine that the controversy here is largely going to hinge on whether or not "alignment by suspension" and the "plumb-bob" action is or are elements of any of the claims in suit. The best answer to this is the claims themselves and the

specification of the patent in suit. One may search in vain to find one single word sustaining the "plumb bob" theory or the "*alignment by suspension*" theory which took root in the decisions in the Fifth Circuit. The only "alignment means" provided in the Layne patent is by the "system of wedges" which are suspended and operated from the top.

The following constitutes all that can be found in the Layne patent on the subject.

Thus in the preamble, page 1, beginning line 15, the patentee states among his objects: "To provide means by which a pump *may be placed in any desired position in a well, centered, raised or lowered and fixed* in position by manipulating from the outside entirely" and further "to provide improved means for centering and *fixing* the pump in proper position in the well casing"; and lines 37-38 "to provide an automatic centering device for the pump in the well."

On page 2, beginning line 1: "In order to previously assemble all the parts and then put the pump into the well and *fix it* in position therein, I provide a system of *wedges 33*, which serve to *fix the pump in place* and *hold it* in the proper vertical position, designed to be operated by means from the top of the well, avoiding the necessity of a man's going into the well in order to *fix the pump in place.*"



And, again, beginning page 2, line 17:

"The wedges 33 may be attached to links 29, which are carried by a sliding collar 28 on the casing 20, the collar 28 being operated by a rod 27, which runs to the top of the well, so that from the top the *wedges 33 may be raised and lowered into place and can be tightened therein.*"

And, continuing:

"The toggle links may be also connected by links 32, to a collar 31, and the collar 31 to a rod 30, which extends to the top of the well as before, in order to manipulate it without going into the well."

Further on regarding the matter of fixation of the pump in the well the patentee says, page 2, beginning line 28:

"Thus in order to obtain greater power and *fix the wedges* more securely in place, it will be observed that by pulling up on the rod 32, the toggle links 34 will cause the wedge blocks 35 to press with great power against the wedges 33, and thus *fix the pump casing in place wherever desired.*"

And concerning *centering* the patentee says, page 2, beginning line 105:

"The wedge system illustrated for *tightening* the pump casing in place may also, if desired, be used to *center* it with respect to the casing."

And, again, page 2, line 112:

"In Figures 10 to 13 I have shown a modified form of the apparatus which uses a similar series of wedges for *fixing the pump in place*, as illustrated best in Figure 11."

And then again page 3, beginning line 5:

"It will be plain that by turning the screws 65, the bottom wedges are drawn upward against the wedges 62, by which the casing of the pump is fixed in any desired place and tightened in the well casing 16."

The absolute rigidity and stiffness of the pump structure of the patent is emphasized by the following (page 3, beginning line 34):

"I prefer generally to allow for free flow of water down the well outside of the pump casing and the pump, in order that the water may be drained into the well when desired, rather than pumping the water out; which I attain by dropping the wedges 63 and thereby loosening the wedges 62 from the casing 16, permitting water above pump to pass into the strata supplying the well."

The idea of "permanent fixing" finds further expression from the following (page 3, beginning line 50):

"In general I prefer the form of apparatus as shown in Figure 1, both because the means for fixing the pump in place is more easily adjusted, and because of the superior mounting of the pump shaft inside its sectional casing as therein shown, and making the pump shaft in sections. But in cases where the pump will not be moved for a long time, the device of Figure 11 may be used for wedging it in place."

And again (page 3, beginning line 69):

"It will be seen also that the toggle levers used for actuating the wedges may be used or not, as desired, since the wedges alone will be amply sufficient in the apparatus of Figure 1, as well as in that of Figure 10."

Then turning to the claims we find the following expression in various forms constituting an element of claims 1, 2, 3, 4, 5, 6, 7, 8, 18, 19, 21 and 22: "Means for *fixing* the pump at any desired point in the well casing."

The foregoing quotations show what an important position the wedges and operating means occupy in the Layne patent with regard to the matter of "fixing", and "centering" or "aligning" (because centering of the pump is with the view of aligning it).

The New Standard Dictionary thus defines "to fix":

"To fasten, attach or secure firmly or immovably; to set or place permanently; make firm or secure; establish; as to fix a statue upon a pedestal."

It is self evident that the idea of "immovability" and "fixed" position, is wholly inconsistent with the "pendent," "plumb bob" theory of plaintiff's counsel. It would, therefore, appear that the Circuit Court of Appeals for the Ninth Circuit were fully justified in their conclusions that:

(1) Any alignment accomplished in the Layne patent was by means of the wedges; and

(2) That these wedges never entered into the claims sued on nor into the defendants' structure.

Except with respect to this one point concerning the function of alignment the Fifth and Ninth Circuit decisions are in harmony.

Both circuits find:

(1) The patent and particularly the claims sued on are valid;

(2) That the Layne patent is for a "stagnant" system of lubrication; and

(3) That the defendants in the Getty case and in the Western Well Works case differed alike from plaintiff's patent in that the said defendants' systems of lubrication were each "circulatory", thereby jointly differing in principle from Layne's "stagnant" automobile-crank-case system, so as to constitute non-infringement in each case.

In making such findings the courts were each following the rule so often laid down by this Honorable Court: That one structure in order to infringe another must operate on the same principle as that other, otherwise there would be a violation of the rule laid down as early as *O'Reilly vs. Morse*, 15 How. 3, that the principle or function of a machine is not the subject of patent.

As this court said in *Westinghouse vs. Boyden Power Brake Co.*, 170 U. S. 1136, 1143:

"The difficulty we have found with this claim is this: That, if it be interpreted simply as a claim for the function of admitting air to the brake cylinder directly from the train pipe, it is open to the objection, held in several cases to be fatal, that the mere function of a machine cannot be patented."

And, again, 1147:

“But even if it be conceded that the Boyden device corresponds with the letter of the Westinghouse claims, that does not settle conclusively the question of infringement. We have repeatedly held that a charge of infringement is sometimes made out, though the letter of the claims be avoided. (Citing numerous cases.) The converse is equally true. The patentee may bring the defendant within the letter of his claims, but if the latter has so far changed the principle of the device that the claims of the patent, literally construed, have ceased to represent his actual invention, he is as little subject to be adjudged an infringer as one who has violated the letter of a statute has to be convicted, when he has done nothing in conflict with its spirit and intent.”

The error on the part of the trial court in the Western case, particularly as concerns infringement, is believed to have resulted from two causes:

- (1) Over-estimation of the so-called “commercial success” of the alleged patented invention; and
- (2) A failure to bear in mind the elementary rule that comparisons for the purpose of spelling out an infringement should always be between the structure *shown and described in the patent in suit* and the defendants’ structure and *not* by a comparison of the defendants’ structure with the commercial structure of the plaintiff.

The proper evidence from which to determine infringement is the patent in suit and the device made by the defendants.

Blanchard vs. Putnam, 75 U. S. 420, 19 L. Ed. 433.

Infringement is a question of law.

Singer vs. Cramer, 192 U. S. 265; 48 L. Ed. 437.

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**"COMMERCIAL SUCCESS" HAS NO PLACE IN THIS CASE.**

To support its argument for a construction of the patent in suit broad enough to cover the defendants' device, the plaintiff says that its system has gone into extensive use and has supplied a long-felt want. This is petitioner's only basis for urging a broad construction of the claims of its patent. There might be some force in this argument if the Layne pumps *as installed* were like the patent in suit, but they are not. The pumps actually installed by plaintiff (see Plaintiff's Exhibit 8, R. 602) differ from the patent in suit in the same essential particulars in which defendants' pump differs from the patent in suit, only in less degree.

It is well established that the test of "great commercial success" is *not* admissible unless the question as to patentable invention still remains *in doubt*,—that is, until after all the regular tests (both affirmative and negative) have first been applied, and the question still remains in doubt.

It is equally well established that proof of "commercial success"—in the exceptional cases where that test is admissible at all—does *not* establish patentable invention, unless the presence of the patented subject-matter is shown to be the *chief*

*factor* (if not the *only* factor) of the commercial success. That is, the evidence must *eliminate all other factors* as substantial contributors to the commercial success, e. g.: extensive advertising; aggressive salemanship; the conjoint presence of other features, either unpatented or covered by other patents not in suit.

The chief question at issue here is not one of *validity* of the patent, since all of the courts have uniformly held the patent valid. The main question relates to *infringement*; and alleged "commercial success" cannot be made use of to enlarge the scope of the patent. Among the cases decided by this court wherein commercial success was given consideration are such as *Smith vs. Goodyear Dental Vulcanite*, 93 U. S. 495 and *Potts vs. Creager*, 155 U. S. 600, which had to do with patentability resulting from a change of one material for another.

In the case of *Olin vs. Timken*, 155 U. S. 155, Chief Justice Fuller said:

"And while the patented article may have been popular and met with large sales, that fact is not important when the alleged invention is without patentable novelty. *Duer v. Corbin Cabinet Lock Co.*, 149 U. S. 216 (37:707).

"If, however, such a construction could be put on the *Timken* patent as would save it from being held invalid for anticipation or for want of invention, that construction would certainly exclude appellant's structure."

Commercial success even if found to favor Layne here is material only where the question of *patentability* is in doubt.

"If the generality of sales were made the test of patentability, it would result that a person by securing a patent upon some trifling variation from previously known methods might, by energy in pushing sales or by superiority in finishing or decorating his goods, drive competitors out of the market and secure a practical monopoly, without in fact having made the slightest contribution of value to the useful arts. The very case under consideration is not barren of testimony that the great success of the McClain pads and clasping hooks, a large demand for which seems to have arisen and increased year by year, is due, partly at least, to the fact that he was the only one who made the manufacture of sweat pads a specialty, that he made them of a superior quality, advertised them in the most extensive and attractive manner, and adopted means of pushing them upon the market, and thereby largely increased the extent of their sales. Indeed it is impossible from this testimony to say how far the large sales of these pads is due to their superiority to others, or to the energy with which they were forced upon the market.

"While this court has held in a number of cases, even so late as *Magowan v. New York Belt. & Pack. Co.* (ante, 981), decided at the present terms, that in a doubtful case the fact that a patented article had gone into general use is evidence of its utility, it is not conclusive even of that—much less of its patentable novelty."

*McClain v. Ortmyer*, 141 U. S. 419;  
35 L. Ed. 800, 804.



And again in the recent case of *Advance Corp. vs. Reflex Co.*, 284 Fed. 117, C. C. A., 7th Cir.:

“While commercial success may be helpful in resolving doubt as to novelty and invention, its persuasiveness may be more or less diluted, when causes other than that of novelty of the article apparently and materially contribute to the success. Here there appears, not only the claimed better quality, but the evidence shows also a campaign of extensive and apparently judicious advertising, which, coupled with, doubtless, good business and merchandising methods, has unquestionably been very influential in making a market for this product, beginning when appellant became interested in it, 10 years after the patent grant.”

Manifestly the court in the *Getty* case meant nothing more than that when it credited Layne with commercial success to uphold the patent and save it from invalidity.

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**REPLY TO PLAINTIFF'S BRIEF.**

Plaintiff sets up two lines of argument: One embraced in its brief accompanying its Petition and the other embodied in its main or so-called Opening Brief.

Naturally and foremost the doctrine of *Adamson vs. Gilliland*, 242 U. S. 350, is urged with persistence on this court.

DISTRICT COURT'S OPINION AS TO INFRINGEMENT  
NOT UNASSAILABLE.

It is submitted that the presumption of correctness which attaches to the findings of a trial judge on questions of disputed fact has no application here. The Trial Judge did not see the mechanism of plaintiff nor of defendants operated (as was the case in *Hildreth vs. Mastoris*, 254 U. S. 622.) Furthermore, he substituted for the testimony of all the fact witnesses, including the patentee Layne, the *theories and conjectures* of the expert witness, Doble, Sr., coupled with certain speculations on his own behalf.

In *Adamson vs. Gilliland*, *supra*, the question had to do solely with regard to the date on which certain castings were made, which castings were part of an alleged prior use. Under the well established rule prior use has to be proven beyond reasonable doubt. There was conflicting testimony relative to the *dates of making of the castings* and the trial judge who had an opportunity to observe the demeanor of the witnesses found that the date contended for by the defendant had not been proven with sufficient definiteness. The Court of Appeals reversed the trial court and the Supreme Court in turn reversed the Circuit Court of Appeals for the reasons stated *ante*.

In the instant case the issue does not have to do with prior use, but rather with *infringement*, which is a question of law, *Singer vs. Cramer*, *supra*.

The evidence on which Judge Dietrich based his findings consisted chiefly as we have said of opinion testimony, which testimony and all the other evidence in the case was considered in full by the Circuit Court of Appeals. The District Court's findings as to the operation of defendants' pump are speculative in the extreme.

For instance Judge Dietrich in his opinion (R. 895) said in comparing defendants' mode of lubrication with that of the Layne patent:

*"Possibly a larger quantity will escape at the bottom of defendants' structure. . . . Indeed, it is very probable that in both mechanisms a comparatively static condition is, under ordinary conditions, maintained. . . . But, were the contrary view to be taken, it would still remain true that the plaintiff's lubricating system is practical and efficient, and is a part of its combination invention, the fruits of which another may not rightfully appropriate by substituting for a single and successful feature other means for accomplishing the same result."*

As a matter of fact except as to the first conclusion, the learned judge was in error, because all the witnesses including the patentee Layne and his counsel admit defendants' system is not static but circulatory; and the patentee discarded the lubricating system of his patent as *impractical and inefficient*.

The District Court was only able to find infringement by placing a new construction upon the Layne patent, and one which was at variance with the

findings of the Circuit Court of Appeals for the Fifth Circuit. This new interpretation on the part of the trial judge was arrived at by substituting for the language of the patent his own conjectures, aided somewhat by the theories of plaintiff's expert and the arguments of plaintiff's counsel. When the District Court says:

"In the actual operation of the plaintiff's mechanism there is necessarily some escape of thin oil through the bottom bearing, for, as already explained, a perfect closure at this point cannot be maintained,"

it certainly is overlooking entirely the following provision of the Layne patent:

"I consider it of great advantage also to arrange the pump shaft in a closed casing with stuffing box at surface of ground at top of pump, so that by the use of the packing boxes *an air-tight chamber* can be maintained, and water kept out of the casing 20, or kept filled with clean liquid, if desired, thereby providing an efficient lubricating system for all bearings of the pump."

The District Court also erred in attributing this conclusion to "the actual operation of the plaintiff's mechanism," since the mechanism of plaintiff's *patent* was never actually operated. Layne, the patentee, on cross-examination, admitted that he had never used his "wedge system," nor his "toggles" nor his "stuffing boxes" nor his "chain and sprocket mechanism" for tightening the latter.

So far as *fact* witnesses are concerned there is no conflicting testimony as to the mode of opera-

tion of defendants' lubricating system. The trial judge did not hold that defendants' lubrication was of the *stagnant* type, but rather that it *might become* stagnant if the tubes were sufficiently packed with hard grease. In reality, the finding of the trial court was one of mixed law and fact. It depended in part upon the mode of operation of defendants' pump but to a *greater extent* upon an interpretation of the Layne patent. In other words, where a Court of Appeals had previously held the Layne patent limited to a "stagnant" system of lubrication the trial judge in the present case found it necessary to adopt a different interpretation of the patent in order to show infringement on the part of defendants. We know of no decisions which hold that the findings of a trial judge on a question of infringement are in any sense *unassailable*.

Petitioner's main brief or so-called "Opening Brief" from page 8 to page 75 is devoted entirely to an effort to explain the meaning of the three claims in suit. While contending that the present invention is marked by great simplicity, and notwithstanding the fact that the three claims in suit collectively embrace not over fourteen lines, plaintiff finds it necessary to devote over seventy pages in an attempted explanation of the meaning of the said claims in the face of the fact that the courts have uniformly held that the patent itself must be sufficiently clear and definite to apprise the public as to the exact nature of the invention (Grant

vs. Raymond, 6 Pet. 218; Beidler vs. U. S., 253 U. S. 447). Either the patent is vague and indefinite to the point of invalidity, or else plaintiff is seeking to warp the apparent meaning of the claims so as to cover something not contemplated on their face.

It is scarcely necessary for this court to do more than to read the Layne patent to see the fallacies and manifold weaknesses in plaintiff's case. Nearly every argument and assertion contained in plaintiff's brief relative to the meaning and scope of the patent is directly contrary to the language and evident intent of the specification and drawings of the patent.

Among the many misstatements as to the purposes and operation of the mechanism of the Layne patent may be mentioned the following:

- (1) "Plumb-bob" type of suspension (plaintiff's brief, p. 13;
- (2) Mode of installing "unit by unit" (plaintiff's brief, p. 15);
- (3) Lubrication by "gravity flow" supplying bearings from top to bottom "in series" (plaintiff's brief, p. 28);
- (4) Leaky stuffing boxes (plaintiff's brief, p. 30).

These attempts on the part of plaintiff to misrepresent the meaning of the patent will be taken up for detailed consideration infra.

Layne is not a "Pioneer"; neither is his invention "Revolutionary"; nor is it mildly "Fundamental" nor "Generic."

So often are these catch phrases employed through plaintiff's brief that we ought not to forget what the Appellate Court said in the Getty case (262 Fed. 141, 143):

"The Layne patent too nearly resembles the Crannell patent to be called a pioneer," and that "*its advance over Crannell prevented Crannell from being considered by us an anticipation, and was enough to show novelty, but it stops there,*" and that "the Layne patent must rest, not upon the idea of closure, which would not be patentable apart from the method by which it was accomplished, but upon the *means of its accomplishment*, as disclosed by the specifications of his patent."

And page 142:

"It was only by giving the claim this restricted meaning, and limiting it to the description in the specifications, that the claim could be sustained." (Italics ours.)

In other words, a narrow, specific and secondary patent.

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#### PLAINTIFF'S MYTHICAL EIGHT PROBLEMS.

Plaintiff's counsel in their original brief accompanying the petition for writ of certiorari, beginning at pages 29-30 give eight so-called "problems" which Layne supposedly solved in his 1903 pump.

The first two of these problems are in reality but one, and read as follows:

“(1) How could he obviate the necessity of digging the pit, and thereby eliminate,

“(2) the risk necessarily assumed by man due to (a) danger of caving while the pit was being dug or while the men worked in the pit boarding it up or installing the pump; and

“(b) the risk of personal injury or loss of life (frequent with the dug pit construction) due to the necessity of man descending into the pit to lubricate, make necessary repairs, etc.?”

The answer is that Layne did *not* consider that a pit was a source of danger or a menace to life and limb. His patent drawings very clearly show a pit 15 in both forms of the alleged patented device. Moreover, the British patent to Mather 1894, R. 1039, and U. S. patent to Ivens, No. 705,844, filed more than two years prior to the filing date of the Layne application, each show a deep well of *small bore* having a pumping mechanism arranged pendent therein and so constructed and operated as to do away with the necessity for a pit or for a man descending into the well for the purpose of repairing the pump. Hence the pit problem, if it be such, was solved before Layne's time.

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#### THE PIT PUMP A POPULAR RIVAL TODAY.

It has been shown by the testimony (R. 784-6) without contradiction or qualification, that *there is still today a very large trade in pit pumps* of the



identical character shown in said blue print, plaintiff's exhibit "2".

The third problem which the brief states confronted Layne is as follows:

"(3) How could he construct and assemble on the ground a pump structure of the necessary great length (Layne pump structures, 400 to 800 feet long, have been installed) and still be able to insert it in the small bore of a well?"

Here again is a reference to the Layne & Bowler 1920 pump. The Layne patent in suit never contemplated any structure of appreciable depth. Nowhere in the patent specification is there any reference to a *deep well*. The drawings, on the contrary, show that the pump is no more than 15 to 20 feet below the surface of the ground. In Figure 10, which shows an unbroken section of the well, if it be assumed that the pump casing is of the ordinary diameter of 12 to 15 inches, then the length of the column 16 is approximately 10 to 12 feet and the pit 15 is some 8 to 10 feet in depth. This estimate is further borne out by the fact that Layne's patent specification says, page 3, lines 9 to 13:

"The screws 65 may be operated by means of a socket wrench placed upon a long rod and reached from the surface of the ground, or may be extended to the surface of the ground as desired."

By referring to Figure 10 of the Layne patent drawings these screws will be seen to be on the same level as the pump 21 itself. Obviously Layne

was not contemplating the use of a screw or wrench "400 to 800 feet long" when he made the foregoing suggestion. What he meant undoubtedly was to send a man down to the bottom of the pit 15 and from there operate the screws or bolts positioned 10 to 12 feet below.

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#### ADJUSTMENT BY WEDGES.

Problem No. 4, the brief says, is:

"How could he vary the length of such pump structure, after installation, in order to raise or lower it according to any variation in the level of the water in the well?"

Obviously, by using his patented "wedge system," which defendants do not employ. The patent specification very clearly says at lines 1 to 10, page 2:

"In order to previously assemble all the parts and then put the pump into the well and fix it in position therein, I provide a system of wedges 33, which serve to fix the pump in place and *hold it in the proper vertical position.*" (Italics ours.)

The court in the Getty case (p. 142) recognized this in saying:

"He accomplished its adjustment to vertical positions in the well hole by suspending the shaft, pump and casing from the top of the well, and by a system of wedges holding the well mechanism in position when adjusted."

**PROTECTION BY STUFFING BOXES.**

Problem No. 5 is stated as follows:

“How could he protect the many necessary bearings for the long pump operating shaft so that the sand and other destructive detritus carried by the water being pumped would not cut out or destroy such bearings?”

The Appellate Court in the Getty case (p. 142) said:

“ . . . However, the specifications of Layne’s patent show that *he relied upon stuffing boxes at the top and bottom of the shaft to effect the closure, and to prevent entrance of water and sand*, to the detriment of the shaft and bearings.” (Italics ours.)

(Note exclusion of *both* “water and sand.”)

Eisler, *supra*, protected his line shaft bearings from sand and detritus by shaft casing and stuffing boxes besides providing for lubrication.

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**ASSEMBLY.**

Problem No. 6 is said to be :

“How could he assemble the bearings and pump shaft in proper relation and maintain the bearings in such relation without the necessity of man descending into the well hole?”

This is done, according to the directions of the patent, by assembling the entire structure on the ground and thereafter lowering the same as a unit into the well. That there can be no doubt as to

this, reference is made to lines 1 to 5, page 2, of the Layne patent, reading as follows:

“In order to previously assemble *all the parts* and then put the pump into the well and fix it in position therein, I provide a system of wedges 33,” etc. (Italics ours),

and again at lines 66 to 69, page 3:

“The whole apparatus being self-contained, can be put together in proper form and lowered into the well *at once*.” (Italics ours.)

Defendants, on the other hand assemble their pump section by section, adding thereto as the sections are lowered into the well. It is obvious that the latter method of assembling the pump has nothing in common with the method proposed in the Layne patent.

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#### ALIGNMENT.

The 7th problem stated in the brief is:

“How could he provide for the alignment of such a long pump shaft in the well?”

There seems to be no great difficulty in supporting a 20 foot shaft in alignment. The *Layne patent specification nowhere refers to the matter of alignment*. Like all of the other pumps of the prior art which were not intended for greater depths than 25 to 35 feet, the problem of shaft alignment was non-existent. Hence, the reason for Layne's failure to make any mention thereof in his patent.

## LUBRICATION.

The 8th and last problem stated in the brief is:

“How could he efficiently lubricate the many bearings required in such a structure?”

Lubrication seems not to have concerned Layne in 1903 to any considerable extent. He has in his specification enumerated *twelve* distinct and different objects and advantages of his invention, and it is to be presumed that in so detailing at great length the *salient* features of his alleged invention he would not be likely to overlook anything of such importance, were it within the contemplation of his scheme. Lubrication is thus disposed of by the patentee (R. 1004, column 2):

“I consider it of great advantage also to arrange the pump shaft in a closed casing with stuffing box at surface of ground at top of pump, so that by the use of the packing boxes an *air-tight chamber* can be maintained, and water kept out of the casing 20, or kept filled with clean liquid, if desired, thereby providing an efficient lubricating system for all bearings of the pump.”

The foregoing quotation is made clear when taken in connection with the following statements found on page 2, lines 83 to 96 (R. 1003), of the Layne patent specification:

“This pipe or tubular shaft 44 also serves the purpose of providing convenient means for forcing the liquid out of the pump shaft casing. By forcing air in at the top of the casing 20 by means of the pipe 52, the liquid can be forced down to the bottom of said casing 20,

and by means of the small opening 45, in the bottom of the tubular shaft 44, the fluid can be forced out at the top 54, and keep the casing clear in order to leave the bearings clean therein and not interfere with the working of the pump, or by forcing fluid in at the top 54, the operation will be reversed, and the fluid ejected from pipe 52."

If, as the brief of plaintiff intimates, Layne's problem was how to lubricate *efficiently* the bearings within the shaft casing then certainly Layne failed to solve this problem by the structure which he shows and describes. This is the lubricating system of Layne which the Court of Appeals for the Fifth Circuit has aptly termed a "stagnant system".

Eisler has an encased line shaft and efficient lubricating means.

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#### **"GRAVITY FEED" FOREIGN TO LAYNE.**

With such persistence and art has plaintiff in its brief urged that Layne's patented method of lubrication is a "gravity feed" with "downward circulation" from "bearing to bearing," the lubricant finally passing out through the stuffing box 40 into the pump, that it is again necessary to point a warning as to the fallacy of such argument.

For instance, on pages 29-30 of plaintiff's "opening" brief it premises its argument by this statement which is quite correct:

"In Figure 7, the stuffing-box 50 is illustrated as a closure means for the shaft enclosing casing 20 at the top thereof. In Figure 5, a stuffing-box 40 is illustrated as a closure means for the shaft enclosing casing at the bottom thereof."

But then plaintiff continues with this misstatement:

"According to the fact and, as is well known in the world of mechanics, a stuffing-box operates as a bearing and, when used in connection with a high speed rotating shaft, the stuffing material therein cannot be maintained in such close relation with the shaft as to prevent the passage of all liquid between the stuffing and shaft."

1st. The "fact" is lacking.

2nd. A "stuffing box" is not synonymous with a "shaft bearing."

3rd. "Stuffing boxes" are frequently used with high speed, rotating shafts, in various classes of machinery in successfully maintaining perfect closure; e. g., ammonia compressors, where ammonia gas, which, if allowed to escape in only minute quantities, would contaminate the air of the compressor-room and overcome the workmen, and in which apparatus extremely high pressures continually prevail, are in every-day use. Everyone with only a rudimentary knowledge of mechanics knows that a reciprocating shaft is much more difficult to pack against leakage than is a rotating shaft.

Then counsel proceeds (page 30) with this obvious statement of fact (*italics theirs*):

“Like every other type of bearing, the *stuffing must be lubricated or it will heat and burn, thus being destroyed*” (*Italics theirs*),

apparently forgetful that Layne in his patent (preferred form Fig. 1) provides for lubrication by charging his oil chamber within his shaft-enclosing casing with lubricant; thereby *preventing* his packing burning out.

And then comes the conclusion of plaintiff's argument and on which fallacy it builds its whole case (p. 31):

“Therefore, in the Layne patent, the lubricant, fed into the upper end of the shaft enclosing casing, will circulate or flow down through each succeeding bearing therein *and a substantial portion thereof, if not all thereof, will pass through stuffing-box 40 into the pump casing 21.*” (*Italics theirs.*)

We have already seen that the modified form of structure shown in Figs. 10 to 13, and on which structure the claims in issue alone are readable, has not provided *any means* of lubrication. The only form of Layne's device that provides for lubrication is his preferred form of Figs. 1 to 9, inclusive, employing stuffing boxes at top and bottom, and the patent says this stuffing box is to maintain an “air-tight chamber”—a much harder thing to do than to maintain an *oil-tight* chamber. You can keep in *oil* when you cannot keep in *air*! Lubrication of Layne is not a “gravity feed”. In fact, we have shown,



*it would be impossible to lubricate Layne's structure by any gravity system and for the reason that oil is forced in from the bottom and not from the top.*

Plaintiff, however, attributes his theory as to Layne to an alleged finding of "mechanical facts" on the part of the trial Judge. Obviously, the trial Judge did not make any such *finding of facts*. That part of Judge Dietrich's opinion to which plaintiff is referring is conjectural and speculative in the extreme and cannot be termed a finding of "fact". For instance, the statement by the trial court "that perfect mechanical inclosure of the shaft is, of course, unattainable" is not based upon any evidence in the record and is directly contrary to statements contained in the patent in suit and to the well recognized purposes and functions of a stuffing box. The trial court further said:

"It (the shaft) must protrude from the stationary casing to connect with the rotating propeller, at a point where the pressure of the water is the greatest."

Now, it is apparent that the contrary is true, namely, that the pressure, rather than being highest at the center of a centrifugal pump, is lowest. It is elementary that a centrifugal pump creates a suction at the center and a pressure at the periphery; otherwise it will not function as a centrifugal pump. Judge Dietrich's hypothesis overlooks the fact that if Layne's stuffing boxes were loose fitting the action of the pump would be to pump as much oil from above as water from below.

THE LOWER STUFFING BOX 40-41 OF LAYNE DESIGNED TO  
PREVENT CIRCULATION.

Referring to Fig. 5 of the Layne patent in suit, attention is called to the fact that the suction intake 22 is coaxial with the runner 38 and that the discharge column 23 takes off near the periphery of the runner casing. In other words, like in all centrifugal pumps suction is at the center of the runner and the accumulated discharge pressure is at the periphery. Naturally if a suction is applied at the center of the runner so as to suck up water through the pipe 22 into the runner case, it exerts a like suction downward above the runner. If it was not for Layne's stuffing box 41 above the runner the latter under high rotative suction, creating speed, would *draw the oil out of his reservoir tube 20 directly into the runner and mix this oil with the water being pumped!*

Differently expressed, the axis of the runner is the zone of suction of the pump interior, i. e., the two sides of the runner around the hub lie in the zone of vacuum. Hence when the runner is working, suction is applied above as well as below the runner. The same suction or vacuum which lifts the water through 22 from the well would naturally tend to suck the oil out of the inner tube or reservoir tube 20 above the runner *if Layne did not interpose his stuffing box 41. Hence we see the reason for his stuffing box 41, which, of course, is to form a fluid-tight (air-tight, says the patent) barrier between the inside of the tube 20 and any part of the well or pump mechanism.*

Now turning to the defendants' pump and as illustrated in the Halstead patent, and also model Exhibit W, it is observed that the latter has a bottom bearing 17 bridging the discharge or pressure side of the pump represented by the discharge column 9-9a. This pressure in the discharge column is such that ordinarily well water in the discharge space *would force its way up around the unpacked bearing 17* directly into the inner tube 9a and such pressure would be sufficient to cause the tube 9a to fill with the water and force out any oil in it. But by means of the drain tube 28 there is a double circulation of liquid provided for: (1) the downward circulation of the lubricating medium, whether emulsion, oil or grease and out through the tube 28 into the well; and (2) a very brief and short upward circulation of pumped water from the discharge immediately above the runner and below the lower drain tube coupling 17 to the tube 28, where this upward flow is immediately shunted out through the drain tubes into the well. This shunt or discharge under pressure of upward leakage acts like an ejector pump to accelerate the lubricant discharge.

Of course, there is also in Halstead suction applied at the center of his runner, and this suction can at best only extend upwardly through the adjacent pump case bearing; this suction then opening into the discharge column *below the drain tube bearing 17*. Not only is there a total interruption in the suction passage above the runner of Halstead, but even if it continued up as far as the channel 27,

with which the drain tubes 28 connect, the suction would, of course there be broken.

*In short, Layne uses a stuffing box to keep his lubricant in; and Halstead avoids the use of a stuffing box so as to let his lubricant out.*

These differences extend to differences in principle, difference in mode of operation and difference in results of the two devices.

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**THE "PENDENT" STRUCTURE IS NO PART OF LAYNE'S  
CLAIMS IN SUIT.**

Plaintiff makes much of the fact that the Western Well Works' pump is suspended from the top of the well. There is nothing in any of the adjudicated cases showing that that was a determining factor by itself one way or the other. Pendent pumps in bored wells were old long before Layne.

Mather, British, *supra* (R. 1039), is a centrifugal pump for *bored* wells suspended from the top and *shaft bearings* supported by the discharge column as in Western Well. The patent says (p. 1, lines 17-20):

"Referring first to Fig. 1, *A is the pipe which extends down the bore from a framing B at the top of the well and carries at its lower end the pump C. In the pipe, guided by suitable bearings, revolves the spindle D which drives the blades of the pump.*" (Italics ours.)

Thompson, British (R. 1051), *supra*, is also a *pendent* centrifugal pump, suspended by the dis-

charge column as in Western Well Works, with sectional shaft and intermediate bearings, all adapted for a bored well and *capable of removal from the surface*. (Fig. 3 of Thompson, page 5 of the specification, moreover shows a multi-stage pump of this character.)

In the Western Well construction no part of the "pendent weight" is carried by the shaft-tubing. In fact, the shaft-tubing of defendant could not carry any weight by reason of the slip-joint construction.

Further quoting from the plaintiff's petitioning brief (page 30):

"He conceived the basic idea that such a structure, to be practical and, notwithstanding its great length, be capable of insertion in the small bore of a well, must be built up of many units, so that, *unit by unit*, the structure could be assembled at the mouth of the well bore and, after the addition of each succeeding unit, be lowered a unit length into the well."

This is a plain mis-statement of the disclosure of the patent as already pointed out in answering "Problem six", *supra*. The Layne specification mentions in at least three different places that the structure is *wholly assembled* before any part is inserted in the well, and that it is all lowered "at once." See, *supra*.

In another paragraph plaintiff's counsel states (page 30):

"He appreciated that such a sectionalized structure, made up of as many units as the

depth of the well required, would also necessarily be adapted to be lowered or raised, according to any variation in the level of the water in the well, by simply adding a unit to or subtracting a unit from the structure."

We have already pointed out that there is no basis whatever in the Layne patent for a statement to the effect that Layne contemplated raising or lowering the position of the pump in the well by adding a unit to or subtracting a unit from the structure. What the patent says is this:

"In order to previously assemble all the parts and then put the pump into the well and fix it in position therein I provide a *system of wedges*," etc. (Italics ours.)

Without this wedge system there is no means shown for raising or lowering the position of the pump in the well, and these defendants do not employ wedges nor any equivalent mechanism in their pump. (See also Getty decision.)

Also the brief states (p. 32):

"Mr. Layne also conceived the idea of utilizing this same shaft enclosing casing as a means or *conduit for conveying lubricant* to each of the bearings therein by providing for the feeding of lubricant into the casing above the topmost bearing therein so that such lubricant would, by gravity, circulate or pass down between such bearing and the shaft and between each succeeding bearing and the shaft, thus lubricating all the bearings *in series*." (Italics ours.)

This is an obvious error, since as we have shown there is no provision whatever in Layne for feeding

lubricant into the casing above the topmost bearing. Any lubricant admitted to the shaft enclosing casing in the Layne patent must come in through the pipe 44 under pressure until it gradually fills the said casing to the level of the pipe 52, which latter enters the casing below the topmost bearing. Also as we have pointed out *supra* there is nowhere any reference to feeding lubricant "by gravity," or allowing it to enter the bearings in succession or "series" except in an *upward* direction.

Moreover, in the modified form shown in Figs. 10, *et seq.*, as we have also shown, *no lubrication whatever is provided for.*

Layne's shaft-tubing of Fig. 1 is an oil *receptacle* and not a *conduit*.

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**PLAINTIFF'S LIBERTIES IN RECONSTRUCTING THE  
CLAIMS IN SUIT.**

After all this disregard for the plain disclosure of the patent drawings and specification, plaintiff's counsel (at pages 33 and 34, petition and brief, and pages 14-15 of their opening brief) reconstruct, or attempt to reconstruct, the very claims in suit so as to expand them from short, concise statements of from 25 to 40 words each into well rounded and all-embracing specifications of upwards of 200 words. For ease in comparison the claims in suit are set out below in parallel columns with the recreated and reconstructed claim which plaintiff's counsel say

"embrace, express and embody Layne's generic invention":

#### CLAIMS OF PATENT IN SUIT

9. In well mechanism the combination with a pump casing, of a rotary pump of a jointed pump shaft and a closed casing surrounding the pump shaft from the pump to the top of the well.

13. The combination with a pump and its actuating shaft of a sectional casing therefor provided at each end of each section with a fixed block with bearings for the shaft, the casing being closed at the top and provided with an air vent.

20. The combination of a well casing, a rotary pump therein, and a line shaft for the pump entirely closed off from the water in the well.

#### PLAINTIFF'S VERSION OF CLAIMS.

(Pages 33 and 34, Petition and Brief, and page 14, Plaintiff's Opening Brief.)

A deep well pump mechanism, adapted to be assembled, *unit by unit*, at the mouth of the well bore and be successively lowered therein *a unit's length* after the addition of each succeeding unit, and, when completely assembled and lowered, to *hang pendent* from the surface like a plumb bob; said mechanism consisting of, in combination:

(1) A pump attached to a sectional line or power shaft extending to the top of the well;

(2) A pump casing enclosing the pump impeller;

(3) A water discharge, sectional casing connected to the pump casing and through which the pumped water passes to the top of the well;

(4) A sectional shaft enclosing casing extending from the pump casing to the top of the well and said shaft enclosing casing being adapted to:

(a) Hold in *alinement* the line shaft by means of suitable bearings fixed



within said casing at appropriate intervals;

- (b) To *protect* the line shaft and its bearings from wear or injury by any sand, grit or other bearing destroying detritus carried by the water being pumped; and
- (c) To form a *conduit for lubricant* from the top of the casing down through each succeeding bearing, including the lowest bearing, thus lubricating all said bearings *in series*.

If plaintiff is under the necessity of so expanding and reconstructing the claims in suit to save them from invalidity and show infringement, then indeed this court is justified in affirming the decree of non-infringement.

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**PLAINTIFF'S MISREPRESENTATION AND MISUSE OF  
THE APPELLATE COURT'S DECISIONS.**

At page 26 of plaintiff's opening brief a partial quotation is given from Judge Morrow's opinion and then a deliberate attempt is made to misinterpret it. The quotation in full as it appears (R. 1127) is as follows:

"We find also that the *combination with a 'pump casing'* mentioned in clause 2 of claim 9, the 'closed casing surrounding the pump

shaft' mentioned in clause 5 of claim 9, the 'sectional casing' mentioned in clause 4 of claim 13, the 'casing being closed at the top' in clause 8 of claim 13, and the 'well casing' of clause 2, claim 20, by which the pump is 'entirely closed off from the water in the well', mentioned in the last two words of clause 4 and in clause 5 of claim 20, perform the same function, the preferred form of which is declared by the specification to be made in joints of any desired length, with stuffing box at surface of ground at top of pump, so that *by the use of the packing-boxes an air-tight chamber can be maintained.*" (Italics ours.)

Plaintiff having quoted a portion of the above says immediately following:

"In said quotation, *three* separate and distinct casings, respectively performing entirely different functions, are spoken of as being *one and the same thing and performing the same function;*"

and then attempts to make it appear that Judge Morrow held that the pump casing first mentioned was one and the same with the other casings mentioned. Judge Morrow said nothing of the sort. He referred to "the combination with a pump casing" of the various elements mentioned and concluded the sentence with the portion we have quoted in full: "that by the use of the packing-boxes an air-tight chamber can be maintained", which changes the sense entirely from what plaintiff disingeniously argue.

Likewise in order to bear out the arguments of non-uniformity of decision plaintiff (page 82 and

elsewhere in its opening brief) deliberately misrepresent the opinions of the Fifth Circuit. For instance they argue non-uniformity with respect to closure claiming that the Fifth Circuit has adjudicated that in Van Ness the escape of some oil into the water was unimportant, whereas the Ninth Circuit held that such escape avoided infringement, being one of the main objects to be accomplished.

In regard to this proposition plaintiff mis-states the opinions in that the Fifth Circuit held that the escape of some oil *by reason of defect of apparatus* was unimportant if the means used by Layne for closure were used in the infringing structure, and the Ninth Circuit held that defendant lacking means of closure the escape of the oil *with design* as by ports or drain pipes, avoided infringement.

The Fifth Circuit and Ninth Circuit are not in conflict as to this feature, the Fifth holding in the Van Ness case that a difference in degree does not avoid infringement, and in the Getty case holding with the Ninth that a difference in purpose and structure to accomplish that purpose would avoid infringement.

Again plaintiff says (page 87 of its opening brief):

"In the first place, the lubricant passes through Layne's shaft casing and from the bottom thereof through the stuffing-box into the pump casing, just as the proofs show and just as the Court of Appeals in the *Van Ness* case, held and just as Judge Dietrich herein found to be the fact."

In this plaintiff's advocates commit triple error:

(1) The patent forbids escape of the lubricant through the stuffing box because the latter, with the other seals of the shaft tubing, renders the latter air-tight as well as oil-tight.

(2) The Van Ness case as further interpreted in the Getty case affords its own defense.

(3) Judge Dietrich's finding on the subject lacks sound basis in the light of the Layne patent.

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**REGARDING TAPERED HUBS AND TIGHT JOINTS.**

Plaintiff, in its brief at pages 108 to 114, attempts to make capital out of the slight alteration in the shape of defendants' hubs. At first the hubs were cylindrical. Later they were tapered slightly to facilitate assembly. That is the only difference if difference it can be termed, besides the helical grooves in the bearings, between the showing of the Halstead patent and defendants' commercial structure. Mr. Conant, who is thoroughly familiar with defendants' installations testified at R. 707 as we pointed out that the tubes and hubs are not uniform in size, but by means of this taper, you can more readily center the tube than if it were straight.

Similar testimony is given by the witness Bradford at R. 712.

Plaintiff's brief at page 37 in discussing Layne's wedge system says:

“These are adjuncts, pure and simple, and Layne refers to the use thereof as being optional (p. 2, line 105.)”

This is a plain misstatement of the language of the patent. The passage in question, namely, page 2, line 105, says:

“The wedge system illustrated for tightening the pump casing in place may also, if desired, be used to center it with respect to the casing.”

Thus, instead of making the “wedge system” *optional*, as claimed by the plaintiff, Layne has emphasized its importance and necessity by pointing out additional advantages.

At page 42 of the brief plaintiff says:

“The uncontradicted proofs show it would be impractical to maintain an air-tight joint between such stuffing and the shaft.”

The only proofs referred to by plaintiff consist of Layne’s expression of opinion that a stuffing box should be lubricated in order to prevent its becoming burnt out. The question before the court is not whether such a joint would or would not be practical. The question is as to what the *Layne patent* shows and describes and the patent very clearly states at lines 74 to 82, page 3, that “by the use of the packing boxes an air-tight chamber can be maintained”. Further contradictory proofs apparently overlooked by plaintiff’s counsel are to be found in the testimony of defendants’ expert, Professor Les-

ley, who, at R. 730, said in describing the mechanism of the Layne patent:

“It is sealed against water at the bottom; it is sealed against oil leaking out; the lubricant may be used for such time as is necessary, until it shall have become spent or worn out, and then that air pressure may be applied to the air pipe, 52, and the oil forced down and into the hole in pipe 44 and upward and out one of the openings that are provided at the top, or that the operation may be reversed, and air may be forced in at the top, thus forcing the oil upward and out of the pipe 52.”

---

**RE: HEAVY GREASE.**

At pages 116 to 122 of its Opening Brief plaintiff discusses at great length the use of heavy grease by defendants as if that were a part of Layne's alleged invention and as if it interfered with the circulation of the lubricant in defendants' structure. At page 116 plaintiff argues that defendants, by using a small quantity of heavy grease in the vicinity of each bearing, employs a “stagnant” lubricating system, but at page 118 of the brief plaintiff says:

“As heretofore stated, it is our opinion that it is quite immaterial whether or not a ‘stagnant’ method of lubrication is used. The Layne invention does not reside in any such immaterial feature.”

(But see Getty case, *contra*.)

At page 115 of plaintiff's Opening Brief plaintiff's counsel seeks to give the impression that smearing a shaft for about 30 inches above a bearing would have the effect of completely filling a tube section. Plaintiff quotes the witness Folsom as follows:

"A. We usually only packed the grease *around the shaft before we slipped the tube down*; we used generally about thirty inches on a tube, all we could make stick on, adhere to the shaft, and *then we slipped the tube over.*" (Italics ours.)

Plaintiff neglects to point out that such smearing of heavy grease on a shaft immediately above a bearing comes very far from filling a tube section, which latter, as we have already pointed out is approximately 6 ft., 4 in. in length; the smallest of these tubes being  $2\frac{1}{2}$  in. in diameter (the Anderson Pump having a 3 inch tubing).

Under the heading of Infringement (page 91) plaintiff devotes much space to showing that sand and detritus cannot enter the shaft casing in defendants' pump mechanism. This would seem unnecessary in view of the fact that the Halstead patent, under which defendants are operating, clearly states that the joints of the shaft enclosing casing are *tight enough to exclude sand and detritus although preferably loose enough to admit clear water*. The admission of water is only economical and helpful to aid in lubrication, mixing as it does with defendants' emulsifying oil.

And still plaintiff's counsel in the face of the foregoing say, at top of page 136 of their brief:

"In other words, closure at the bottom of the conduit must be sufficient to protect the shaft bearings from the destructive action of detritus. *But such bottom closure is immaterial as a feature of lubrication.* When the lubricant reaches the bottom of the casing, it has completed its lubricating function." (Italics theirs.)

And then they proceed on the same page to make this mis-statement of evident fact:

"In the Layne structure, lubricant likewise passes out of the bottom of the casing."

Such misrepresentations occur so repeatedly throughout the brief that it becomes well nigh futile to try and meet each and all of them.

---

#### INFRINGEMENT.

It would seem that little needs to be added to show conclusively the lack of infringement by the defendants.

---

#### AS TO CLAIM 13.

No proof whatsoever has been offered to show that the defendants have the combination of claim 13. In fact, any so-called proof to that end would be futile, because it is obvious that the defendants' shaft tubing is not "provided with an air vent," even if it should be assumed that said tubing or



shaft casing is "closed at the top" or "provided at each end of each section with a *fixed block*" or any block.

Such proof on the part of plaintiff as may have been offered and deemed applicable to claims 9 and 20 falls far short of establishing infringement.

Plaintiff, at page 28 of its main brief, and page 33 of its petitioning brief, under the heading Lubrication, argues that pipe 44 of the Layne patent merely serves the same purpose as a vent in a five-gallon coal-oil can. As is well known, a vent in an oil can acts passively to admit air for the purpose of filling the space made vacant by the diminishing oil. Layne's patent specification, on the other hand, says, concerning the so-called air vent:

"This pipe or tubular shaft 44 also serves the purpose of providing convenient means for *forcing* the liquid out of the pump shaft casing. By *forcing* air in at the top of the casing 20, by means of the pipe 52, the liquid can be forced down to the bottom of said casing 20, and by means of the small opening 45, in the bottom of the tubular shaft 44, the fluid can be *forced* out at the top 54, and keep the casing clear in order to leave the bearings clean therein and not interfere with the working of the pump, or by *forcing* fluid in at the top 54, the operation will be reversed, and the fluid ejected from pipe 52." (Patent lines 83-96, page 2.)

Throughout the foregoing the idea of *forcefully* ejecting air or liquid is stressed.

This idea was voiced in the Van Ness case where the court said (213 Fed. 805):

"One function of this air vent is to *force* any water or spent lubricant remaining in the casing, out of it, through an aperture in the top, by *forcing* air through the air vent into the casing, for the purpose of substituting clean liquid or oil." (Italics ours.)

Moreover, the pipe 44 is shown as being closed at its top by means of a valve or plug 54 from which it is obvious that Layne's idea was a stagnant system of lubrication, just as the Circuit Court of Appeals for the Fifth Circuit held in the case of *Layne vs. Getty*, 262 Fed. 141.

As said by this court in *Underwood v. Gerber*, 149 U. S. 225, 37 L. Ed. 710, at page 713:

"In *Miller v. Bridgeport Brass Co.*, 104 U. S. 350, 352 (26: 783, 784) it is said: 'The claim of a specific device or combination, and an omission to claim other devices or combinations apparent on the face of the patent, are in law, a dedication to the public of that which is not claimed. It is a declaration that that which is not claimed is either not the patentee's invention, or, if his, he dedicates it to the public.'

"In *Mahn v. Harwood*, 112 U. S. 354, 360 361 (28: 665, 667, 668), it is said: 'The taking out of a patent which has (as the law requires it to have) a specific claim, is notice to all the world, of the most public and solemn kind, that all those parts of the art, machine, or manufacture set out and described in the specification, and not embraced in such specific claim, are not claimed by the patentee—at least, not claimed in and by that patent. . . . So far as that patent is concerned, the claim actually made operates in law as a disclaimer of what is not claimed.' "

## SUMMARY.

(1) A careful consideration of the prior art represented by the Byron Jackson prior invention and the patents to Eisler, Crannell and Alvord, points, we submit, to a finding of invalidity against the Layne patent.

(2) If Layne is valid at all it covers an invention of a low order and the claims must be construed narrowly.

(3) The File Wrapper shows that Layne was obliged to distinguish his mechanism from that shown in the prior art, especially the patent to Crannell, and to accomplish this he emphasizes not only the effectual closure to provide a stagnant oil system, but the *vents* and *blow off* means to evacuate the spent oil and the "wedges" for aligning and centering the pump; none of which constructions or devices enters at all into the defendants' structure.

(4) Layne has abandoned his patented construction for the reason that it was a commercial failure. A patent is granted for solving a problem, not for stating one. (Columbia Motor Car Co. vs. Duerr, 184 Fed. 893 (Selden Patent).)

"It is one thing to invent the theory of a machine. It is quite another thing to invent a successfully operating machine."

Raisin Seeder Case, 182 Fed. 59, 62.

We anticipate there will be no disagreement of this court with the Appellate Court for the Fifth Circuit on the following self-evident propositions:

(1) That claims 9 and 20 are substantially alike, differing merely in degree.

(2) That a "stuffing box" is a physical closure whereby Layne entirely "closed off the water in the well" from his lubricating chamber around the pump shaft.

(3) That the Layne system of lubrication, resulting from such isolation of the oil chamber from the outside water created essentially a "stagnant" system of lubrication.

(4) That this idea of "stagnation" is confirmed by the use of the blow-off pipes and vent employed in Layne and strikingly absent both in Getty and Western Well Works.

(5) That there is a recognized distinction in the principle of operation between a "stagnant" system of lubrication and a "circulatory" system of lubrication.

(6) That this difference in principle being recognized, the conclusion of non-infringement becomes a necessary deduction.

We submit that the petition should be dismissed and the decree of the Circuit Court of Appeals of the Ninth Circuit affirmed.

Respectfully submitted,

FREDERICK D. MCKENNEY,

CHAS. E. TOWNSEND,

WM. A. LOFTUS,

*Attorneys for Respondents.*

Dated, February....., 1923.



FILED

MAR 10 1922

WM. R. STANSBURY

CLERK

IN THE

**SUPREME COURT OF THE UNITED STATES**

**OCTOBER TERM, 1921.**

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**No. 774. 278**

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LAYNE & BOWLER CORPORATION, PETITIONER,

*vs.*

WESTERN WELL WORKS, INC. (A CORPORATION), RO-  
TARY DRILLING AND DEVELOPMENT COMPANY  
(A CORPORATION), STANLEY M. HALSTEAD, P. E.  
VAUGHAN, AND ALLEN W. ROSS, RESPONDENTS.

---

ON PETITION FOR WRIT OF CERTIORARI TO BE ADDRESSED TO  
THE JUDGES OF THE UNITED STATES CIRCUIT COURT OF  
APPEALS FOR THE NINTH CIRCUIT.

---

**BRIEF ON BEHALF OF RESPONDENTS.**

---

FREDERIC D. MCKENNEY,  
CHAS. E. TOWNSEND,  
WM. A. LOFTUS,  
*Attorneys for Respondents.*



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**BRIEF ON BEHALF OF RESPONDENTS.**

---

The petition for writ of certiorari in this cause appears  
(page 3) to be based upon the sole ground that—

“The said decision herein of the Circuit Court of  
Appeals for the Ninth Circuit, in respect to the ‘mode

of operation' of Layne's mechanism and the construction and scope of his patent claims, is in direct conflict with the decisions of the Circuit Court of Appeals for the Fifth Circuit in the following cases involving the infringement of the same Layne patent No. 821,653 sued on herein, to wit:

"El Campo Machine Co. *vs.* Layne, 195 Fed. 83;

"Van Ness *vs.* Layne, 213 Fed., 804;

"Getty *vs.* Layne, 262 Fed., 141."

In denying the validity of this ground respondents point out that the Layne patent referred to in the petition was held valid and infringed by the Circuit Court of Appeals for the Fifth Circuit in the two cases first mentioned, to wit *El Campo Machine Co. vs. Layne*, 195 Fed., 83 (claim 1 only), and *Van Ness vs. Layne*, 213 Fed., 804 (claim 1 only). In the third case referred to, namely, *Getty vs. Layne*, 262 Fed., 141, the same court held the said patent valid but *not* infringed, there being a different structure involved from that sued upon in the first two cases.

The present petition is directed against the decision of the Circuit Court of Appeals for the Ninth Circuit in the case of *Western Well Works vs. Layne & Bowler Corporation*, 276 Fed., 465 (R., 1122-1148), wherein that court adopting the views last expressed by the Circuit Court of Appeals for the Fifth Circuit, found the said Layne patent valid but not infringed. In so ruling the Circuit Court of Appeals for the Ninth Circuit gave due recognition to prior litigation and to the conclusions of the Circuit Court of Appeals for the Fifth Circuit.

### Decisions of Fifth and Ninth Circuits are in Complete Harmony as to Validity of Layne Patent.

As a matter of fact, therefore, all of the decisions affecting the Layne patent have been uniform in holding said patent valid. The same court which found infringement in two cases, but of different claims in each case, found non-infringement in a third and later case where a different structure was involved and at a time when the court had acquired greater familiarity with the scope and meaning of the Layne patent.

The Circuit Court of Appeals for the Ninth Circuit in the instant cause, with the records of all prior suits before it, found validity and non-infringement in harmony with the findings of the Fifth Circuit of the Court of Appeals. This is clearly shown by the following quotation from the opinion of the court, *Western Well Works vs. Layne & Bowler Corporation*, 276 Fed., 470, 472, (R., 1133):

"In *Getty vs. Layne* (C. C. A.), 262 Fed., 141, the court followed its decisions in the previous cases, determining the question of the validity of the patent in favor of the plaintiff, but the court held that the patent was not entitled to the wide range of equivalents of a pioneer patent."

That this is a correct statement we have only to note the following from the Circuit Court of Appeals for the Fifth Circuit in the *Getty* case, 262 Fed., 143:

"The Layne patent too nearly resembles the Crannell patent to be called a pioneer. \* \* \* Its advance over Crannell prevented Crannell from being considered by us an anticipation, and was *enough to show novelty, but it stops there.*" (Italics ours.)

The Ninth Circuit in the case under consideration gives its stamp of approval to validity of the Layne patent where it is said (R., 1136):

"We are of the opinion that there is invention in the entirely closed casing of the Layne patent as claimed in claims 9, 13, and 20, particularly claim 20, functioning as it does in complete protection to the line shaft from the ingress of water and sand and in protecting the means for lubrication."

### **Layne's Invention is of Narrow Scope.**

Petitioner attempts by the use of incomplete and partial quotations taken from various opinions and, we submit, misstatements of opinions, including opinions of the trial courts and minority opinions of the Circuit Court of Appeals, to show that the Layne invention was of a broad character. But the opinions of the Circuit Courts of Appeals for the Fifth and Ninth Circuits are in full accord as to the *narrowness* of the Layne patent.

*El Campo Case:* The Circuit Court of Appeals for the Fifth Circuit in the Van Ness case, 213 Fed., 805, interpreted the construction put on the Layne patent in the El Campo case thus:

"In the El Campo case, 195 Fed., 83; 115 C. C. A., 115, the court held the patent valid as to claim 13, and that that claim had been infringed. As we understand, the validity of claims 4, 9 and 20 were not passed upon by the court, but were held not to have been infringed. In the present case we are satisfied that claim 13 is not infringed by the Van Ness pump. The last clause of claim 13 reads, 'the casing being

closed at the top and provided with an air vent.' While the Van Ness pump is closed at the top, it is not contended that the pump has an air vent such as the patented pump had and such as the El Campo pump had. One function of this air vent is to force any water or spent lubricant remaining in the casing, out of it, through an aperture in the top, by forcing air through the air vent into the casing, for the purpose of substituting clean liquid or oil. It seems clear that the Van Ness pump had no such member with a corresponding function as the air vent of the patented pump, or that of the El Campo pump, and so cannot be said to infringe claim 13. This, if correct, would prevent complainant from relying upon claim 13 in this case, as a ground of recovery."

*Van Ness Case:* Further, in the Van Ness case, at pages 807 and 808, the court says:

"Giving claim 20 this interpretation (that is, construing the words 'line shaft' as referring only to the part of the pump shaft which alone can be enclosed in practice), it seems that it is substantially like claim 9, except in the omission of the element of jointure or extensibility of the shaft sections, which adds nothing to the novelty and patentability of the device; and that the element common to each claim, viz., the protective or closed casing surrounding the pump shaft from the pump to the top of the well and entirely closing off the water in the well from the shaft and its bearings, is the only element in any one of the claims as to which there is persuasive evidence in the record both as to patentability and infringement."

Continuing, the court says:

"The word 'closed' in claim 9 seems to mean as much as the words 'entirely closed' in claim 20."

\* \* \*

"It seems quite clear that the idea of a protected casing for a pump shaft without restrictive interpretation would contain no novelty and would not be patentable, and, if this element in the patent is given the unrestricted meaning that its language admits of, it would destroy the claim." \* \* \*

\* \* \* "It also seems fairly to appear from the record that such a protective casing as that set out in the specifications contained novelty enough to constitute invention."

And at page 809:

\* \* \* "It seems that the question of infringement, like that of patentability, is a *close one*." (Italics ours.)

The opinion in the Van Ness case leaves the character of the Van Ness structure in doubt, but by referring to the Getty case (262 Fed., 141, 144) we find that Van Ness used "thrust bearings and a collar to help close the bottom of the shaft casing."

We are further aided in connection with this matter by reference to the opinion of the District Court in the Getty case, wherein Judge Jack, speaking for the court, said (R., 1011):

"There is this difference between the Van Ness and the Getty apparatus. In the former the weight of the shaft is largely sustained by a thrust bearing near the bottom of the casing, so that the pressure on the thrust bearing would tend to make the casing nearer waterproof. In the Getty apparatus, which rests on the bottom of the well, there are no thrust bearings, but all the bearings are of the ordinary kind, so that, as argued by counsel, more water would pass into the shaft casing of the Getty pump than into that of the Van Ness pump."

We thus see at the Van Ness stage of the litigation that the court appreciated the mechanical closure means of Layne that were essential at the bottom of the shaft tubing to make anything like a "closed casing." In Layne, as the court says, "the closure in the patented casing is effected by stuffing-boxes;" and in Van Ness it was effected by "thrust bearings and a collar to help close the bottom of the shaft casing." The importance of "mechanical closure" is emphasized in the Getty case, as we will see.

*The Getty Case:* The Getty case first came before the Circuit Court of Appeals (222 Fed., 917) on appeal by the plaintiff against the refusal of the lower court to grant a preliminary injunction based on the prior adjudication in the Van Ness case, the court saying (page 918):

"A hearing was had upon the motion for a preliminary injunction, based upon *ex parte* affidavits, and the injunction was refused. To review this order the appellants have brought the case to this court.

"Claim 20, sustained as valid by this court in Van Ness *vs.* Layne, 213 Fed., 804; 130 C. C. A., 462, is the only claim of the patent involved in the present controversy. As before stated, the hearing before the District Judge was had upon mere *ex parte* affidavits. Appellee denied that his improvement infringed claim 20 of appellants' patent, and it is apparent from an examination of the contradictory affidavits that the question of infringement *vel non* is left in considerable doubt."

The court held that there had not been an abuse of discretion and denied plaintiff's motion. This in itself did not speak a high regard for the Layne patent in the mind of the Court of Appeals.

In 262 Fed., 141, the case, after final hearing, came again before the court for review following Judge Jack's decision sustaining the patent and adjudging infringement against his own better judgment, the attitude of Judge Jack being indicated by the following excerpt from his opinion in referring to the argument that there was no invention over Crannell in interposing intermediate bearings and oiling by simply letting the oil run down from bearing to bearing, as would occur to anyone, and had always been the method of oiling vertical shafts (R., 1011):

"The court is much impressed with this argument. The insertion of additional bearings to prevent whipping of the shaft where the distance between bearings is too great, is as simple and natural a thing to do as the putting in a fence of extra posts to prevent sagging of a barbed wire, where the posts of the panels are too far apart. *Were the question a new one, I should be inclined to hold the patent invalid*, but the same issue was raised and directly passed on by this court and by the Court of Appeals for the circuit in the Van Ness case sustaining the patent." (Italics ours.)

The Court of Appeals in the Getty case (262 Fed., 142), in construing claim 20, said:

"The twentieth claim of the patent—that sustained in the case of Van Ness *vs.* Layne, *supra*—covered 'the combination of a well casing, a rotary pump therein, and a line shaft for the pump *entirely closed off from the water in the well.*' \* \* \* *It was only by giving the claim this restricted meaning, and limiting it to the description in the specifications that the claim could be sustained.*" (The italics of the last sentence are ours; the first italics are the court's.)



Continuing, the court said, page 143:

"The Layne patent *too nearly resembles the Crannell patent to be called a pioneer patent*, though it did accomplish a revolution in the well-drilling industry. Its merit was in adapting the Crannell type of pump to a narrow and deep well hole in a way that has been held by us to exhibit novelty. While the substitution of mere mechanical equivalents for the means adopted by Layne could not avoid infringement of his patent, it is also true that the range of equivalents cannot be enlarged upon the idea that his patent was a pioneer one in the pump art. *Its advance over Crannell prevented Crannell from being considered by us an anticipation, and was enough to show novelty but it stops there.* The Layne patent must rest, not upon the idea of closure, which would not be patentable apart from the method by which it was accomplished, but upon the means of its accomplishment, as disclosed by the specifications of his patent." (Italics ours.)

Similarly, the Circuit Court of Appeals for the Ninth Circuit in its decision in the case now sought to be brought here for review, says that (Rec., 1131):

"We have placed some emphasis upon the fact that all the claims in this patent relate to one principal operative invention of a well mechanism, and in that relation they all in a more or less direct and practical way were designed to co-operate and supplement each other to the common intent and purpose of being employed in an operating pump apparatus for a driven or artesian well; but when we turn to the analysis of the claims in suit, we find that the essential elements claimed to have been infringed are limited and narrow and relate only to the combinations of a

rotary pump with an actuating shaft entirely closed off from the water in the well by the casing surrounding the pump shaft."

Quite obviously, both courts agree that to impart validity to the Layne patent and to the particular claims sued upon due regard must be paid to the mechanism disclosed in the drawings and specification of the patent. This is a well-settled principle of patent law.

Moreover, it is self-evident in the Getty case the court was favorably inclined to resolve the *doubt* as to validity in favor of Layne, based on alleged commercial success. In the instant case the court also resolves in favor of Layne, and thus there is full accord between the courts of these two circuits.

#### **Holding of Non-Infringement by Fifth and Ninth Circuits Also in Harmony.**

The Court of Appeals for the Fifth Circuit, in finding non-infringement in the case of Getty *vs.* Layne, *supra*, said, at page 143:

"Layne's method of lubrication was to put the oil in at the top and to permit it to descend to each of the bearings, and remain stagnant within the shaft casing until ejected from the top after it had become spent by air pressure through an air vent. When it was ejected, it was replaced by clean oil from the top again. On the other hand, the oil was confined at the bottom of the well by use of a packing or stuffing box. Getty adopted a circulatory system of lubrication. By it the oil was also introduced from the top, and descended to the lower bearings by gravity.

However, at the bottom there was only a partial obstruction to its exit, presented by a long sleeve bearing. Its passage out from the shaft casing was automatic and continuous, so that there was a constant and free flow of lubricant from the top of the line shaft, throughout its length, and out through its bottom. This method was claimed to be necessary to Getty's device, because wear on the upper bearing required a continuous supply of fresh oil for its proper lubrication. These functional differences between the stagnant and circulatory systems of lubrication prevent their being considered as merely mechanical equivalents."

And at page 144:

"We think Getty has accomplished closure and lubrication by means so functionally different from Layne's disclosure in his patent that they cannot be said to be mere mechanical equivalents, but rather distinct methods of attaining the same object; the object itself not being patentable."

The Circuit Court of Appeals for the Ninth Circuit in finding non-infringement in the instant case quoted verbatim the above language (page 143) from the opinion in the Getty case (see R., 1135) and concluded (R., 1136):

"The difference between the Layne patent and the Getty mechanism, as it appears in *Getty vs. Layne*, *supra*, is essentially the difference between the Layne patent and the defendants' mechanism in this case."

**Alleged Conflict Between Majority Opinions of Circuit Courts of Appeals for Fifth and Ninth Circuits, on the One Hand, and Opinion of the Trial Judge and Dissenting Opinion of Judge Gilbert, on the Other Hand.**

Petitioner elsewhere in its petition (page 11) urges the following unusual ground as further showing an alleged conflict in the decisions of the courts affecting the Layne patent:

"In respect to the construction and scope of the three Layne patent claims, involved herein, there is also a direct conflict between the decisions respectively rendered by said two Circuit Courts of Appeals and between the views of said two judges rendering the decision herein of the Circuit Court of Appeals and the views respectively expressed by Judge Gilbert in his dissenting opinion and by Judge Dietrich in rendering the District Court's decision herein."

In answer to this it is only necessary to point out that inasmuch as the decision of the trial judge and the minority opinion of Judge Gilbert did not prevail, they do not give rise to a conflict, nor in anywise affect the legal scope or status of the Layne patent. Moreover, the differences between the judges of the Ninth Circuit were not as to matters of law, but the usual differences as to their respective understandings of the facts. Manifestly, there is no question as to the qualifications of the judges who heard the cause in the appellate court. We do not understand it to be the accepted practice of this court to grant the writ of certiorari to review a patent cause where the judgment of the Circuit Court of Appeals complained of depends solely upon that

court's appreciation of the testimony of witnesses called by the respective parties, nor where the application for the writ is based solely upon the alleged erroneous conclusion of the Circuit Court of Appeals in matters of fact.

**Petitioner's Brief Devoted Almost Wholly to Immaterial Matters.**

Pages 28 to 54 of petitioner's brief, or more than one-half of the entire brief and argument of petitioner, are copied verbatim from the brief filed by petitioner at the final hearing in the case of Western Well Works *vs.* Layne & Bowler Corporation, *supra*. All of this matter has to do with petitioner's theories as to the scope of the Layne patent and its contentions as to the question of infringement by respondent. Obviously, such arguments can have no bearing upon the question at issue, namely, whether or not the Circuit Courts of Appeals for the Fifth and Ninth Circuits are in conflict as to the nature of Layne's alleged monopoly. From this it would seem a logical conclusion that petitioner has nothing to urge in the way of special grounds for granting a writ of certiorari, but, on the contrary, is compelled to resort to arguments which would be proper only in case the writ were granted and the entire record were before this court for review.

**Conclusion.**

That this is not a proper case for the issuance of the writ of certiorari from this Honorable Court is apparent from a mere reading of the decisions of the Court of Appeals for the Fifth Circuit and the Court of Appeals for the Ninth Circuit. In each instance the court held the patent valid.

The decisions of the two jurisdictions, therefore, are in complete uniformity on that subject.

When Judge Morrow, for the Ninth Circuit, finds non-infringement because the defendant in the present suit employed a "circulatory system" of lubrication against the use by the patented device of a "stagnant system" of lubrication, he, speaking for the majority of the court, followed the previous findings of the Court of Appeals for the Fifth Circuit, so that again we have uniformity.

There is no constitutional question involved, nor any important question of general law, much less any question of general law with respect to which there is a lack of uniformity. As has been said elsewhere:

"A Supreme Court, where there are intermediate courts of appeal, is not a tribunal constituted to secure, as its ultimate end, justice to the immediate parties. They have had all that they have a right to claim when they have had two courts in which to have adjudicated their controversy. The use of the Supreme Court is merely to maintain uniformity of decision for the various courts of appeal, to pass on constitutional and other important questions for the purpose of making the law clearer for the general public. Litigants, therefore, cannot complain where they have had their two chances that there should be reserved to the discretion of the Supreme Court to say whether the issue between them is of sufficient importance to justify a hearing of it in the Supreme Court."

Nothing could more aptly express the situation existing between the present parties. They have each had their day

in court and the final judgment passed by the appellate court in accordance with justice and common sense. There is no question of lack of uniformity of decision between the various courts of appeal, and there are no constitutional or other important questions which can be made any clearer than they are now.

For the reasons stated, and because of others which very readily suggest themselves to the Court, it is respectfully submitted the instant petition for certiorari should be denied.

Respectfully submitted,

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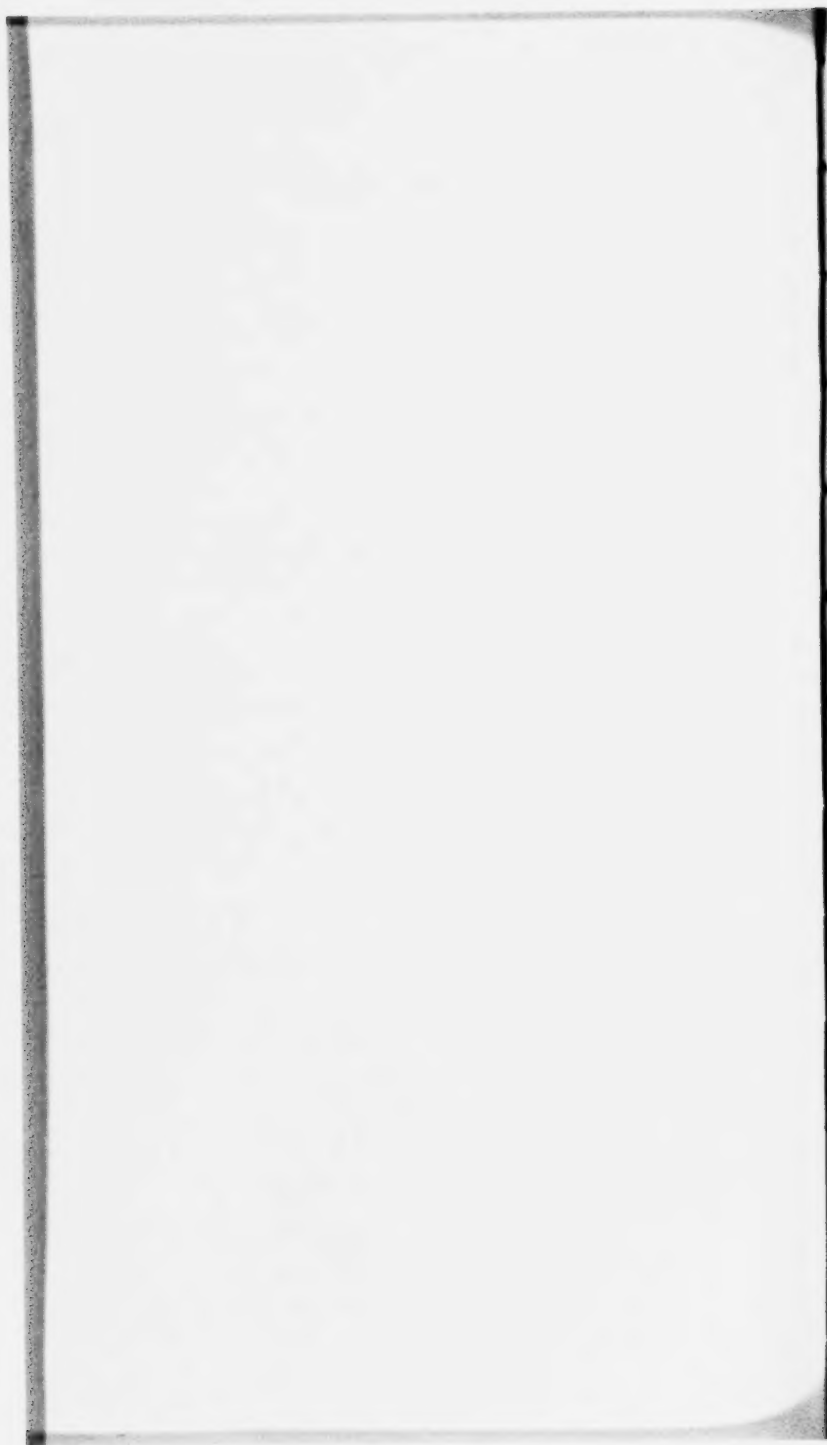
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# In the Supreme Court

OF THE  
UNITED STATES

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LAYNE & BOWLER CORPORA-  
TION,

*Petitioner-Plaintiff,*

vs.

WESTERN WELL WORKS, INC. (a  
corporation), ROTARY DRILLING  
AND DEVELOPMENT COM-  
PANY (a corporation), STANLEY  
M. HALSTEAD, P. E. VAUGHAN  
and ALLEN W. ROSS,

*Respondents-Defendants.*

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PETITION FOR WRIT OF CERTIORARI TO BE  
ADDRESSED TO THE JUDGES OF THE UNITED  
STATES CIRCUIT COURT OF APPEALS FOR  
THE NINTH CIRCUIT

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*To the Honorable, the Chief Justice and Associate  
Justices of the Supreme Court of the United  
States:*

Your petitioner respectfully shows:

On December 31, 1920, after a trial in open Court  
before his Honor, District Judge Frank S. Dietrich,

of Idaho, sitting in the United States District Court for the Southern Division of the Northern District of California, there was made and entered herein an interlocutory decree adjudging valid and infringed Claims 9, 13 and 20 of petitioner's United States letters patent No. 821,653 issued on May 29, 1906, to Mahlon E. Layne for "Well Mechanism" (R. 896). The District Court's opinion appears at page 887 of the Record.

On October 17, 1921, the said decree was reversed by the United States Circuit Court of Appeals for the Ninth Circuit which found petitioner's said letters patent valid *but not infringed* by respondents' well mechanism (R. 1152).

The opinion, of the Circuit Court of Appeals, was written by his Honor, Circuit Judge William W. Morrow and concurred in by his Honor, District Judge Charles E. Wolverton, sitting in the Circuit Court of Appeals in the place of one of the Circuit Judges for the Ninth Circuit (R. 1121).

His Honor, Circuit Judge William B. Gilbert, wrote a dissenting opinion and therein affirmed the correctness of the District Court's decree finding infringement (R. 1149).

It thus appears that District Judge Dietrich, the trial Judge, and Circuit Judge Gilbert found petitioner's patent infringed by respondents' structure, whereas Circuit Judge Morrow and District Judge Wolverton found to the contrary.

On January 16, 1922, petitioner's Petition for a

Rehearing was denied by the Circuit Court of Appeals, Circuit Judge Gilbert dissenting (R. 1153).

*The said decision herein of the Circuit Court of Appeals for the Ninth Circuit, in respect to the "mode of operation" of Layne's mechanism and the construction and scope of his patent claims, is in direct conflict with the decisions of the Circuit Court of Appeals for the Fifth Circuit in the following cases involving the infringement of the same Layne patent No. 821,053 sued on herein, to wit:*

*El Campo Machine Co. vs. Layne*, 195 Fed., 83;

*Van Ness vs. Layne*, 213 Fed., 804;

*Getty vs. Layne*, 262 Fed., 141.

Following the decision in the Van Ness case, *supra*, the Circuit Court of Appeals for the Eighth Circuit held the Layne patent valid and infringed in the case of *Layne vs. United Well Works*.

The following cases, brought for the infringement of said Layne patent, are now pending, to wit:

*Layne & Bowler Company vs. American Well Works, of Aurora, Illinois*, pending in the District Court for the Northern District of Illinois;

*Layne & Bowler Corporation vs. American Well & Prospecting Company, et al.*, pending in the District Court for the Southern District of California;

*Layne & Bowler Corporation vs. Byron Jackson*

*Iron Works*, pending in the District Court for the Northern District of California; and

*Layne & Bowler Corporation vs. Krogh Manufacturing Company*, pending in the District Court for the Northern District of California.

The *broad scope and fundamental nature* of the Layne invention and its *revolutionary* effect on the deep well pump industry throughout the country, are indicated by the following findings of fact respectively announced by the various Courts in deciding some of the above cases involving the Layne patent, it being understood all italics herein may be deemed petitioner's.

In the Van Ness case, *supra*, the Court of Appeals for the Fifth Circuit said:

"The fact that the record shows that there was for some time an unfilled want for some such apparatus as that disclosed by the patent in the deep well irrigating industry is persuasive that the idea involved invention. In this respect the cross examination of the witness, W. B. St. John, a witness for the defendant, . . . is convincing that Layne filled a *long-felt need* in the deep well irrigating business by his *protective casing*, and had invented a practicable and valuable improvement in that art and one entitled to protection for that reason. . . ."

In the *Getty* case, the same Court of Appeals said:

"The Layne patent . . . did accomplish a revolution in the well-drilling industry."

In the case at bar, Judge Dietrich, the trial Judge, in respect to said Layne patent, said:

"Though not, strictly speaking, a pioneer, the patent is of a *fundamental, generic* character, and in expressing his conception in physical form the patentee is entitled to a reasonable range of mechanical equivalents." (R. 891.)

In his dissenting opinion herein, his Honor, Circuit Judge Gilbert, in affirming the correctness of Judge Dietrich's findings herein, said:

"There can be no doubt that the appellee's invention did, as was said in the case of *Getty vs. Layne*, 262 Fed., 141, '*accomplish a revolution in the well-drilling industry.*' And while the invention may not be said to be of a pioneer character, it is, nevertheless, an invention of such merit as to be entitled to protection against a reasonable range of mechanical equivalents." (R. 1149.)

In order to point out, at this time, *the conflict between the decision herein and the decisions of the Circuit Court of Appeals for the Fifth Circuit, in the above mentioned cases involving this Layne patent*, it is necessary to give a brief description of the mechanism embodying the Layne invention. A more elaborate description thereof will be found in the annexed brief.

Prior to the introduction of Layne's revolutionary invention, the general type of pump installation was one involving the digging of an open pit and the mounting of the pump *on the bottom of the pit*.

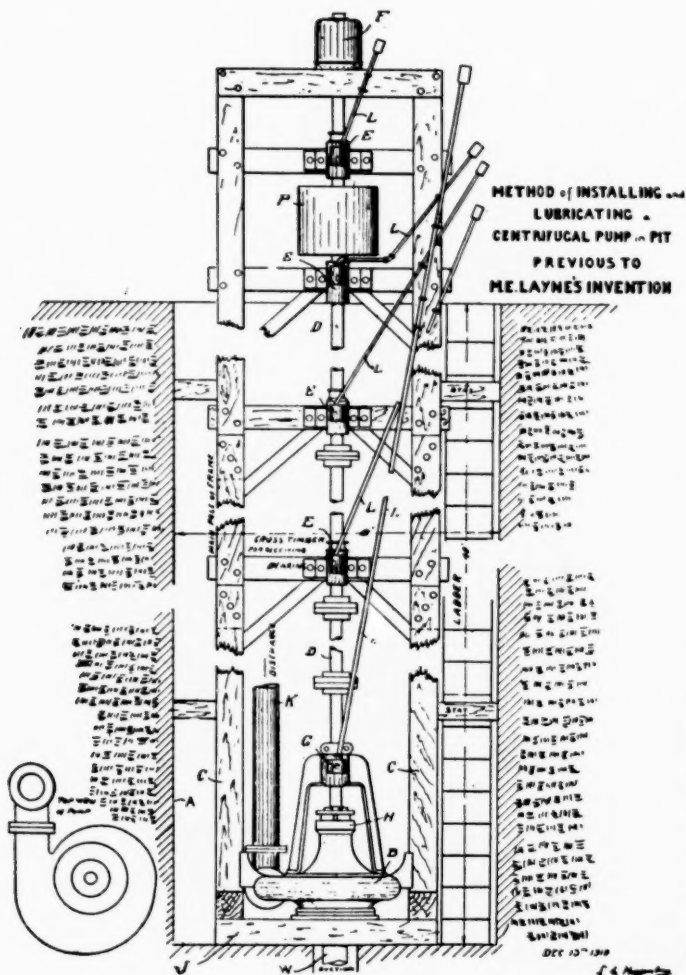
Such a pit construction is illustrated in "Plaintiff's Exhibit No. 2" (R. 915) reproduced on the opposite page.

To obviate all the disadvantages inherent in such a pit construction, and in order to make possible and practical the boring of wells of great depth and the pumping of water therefrom, Mr. Layne invented his deep well pump mechanism, adapted to be assembled, *unit by unit*, at the mouth of the well bore and be successively lowered therein *a unit's length* after the addition of each succeeding unit and, when completely assembled and lowered, to *hang pendant* from the surface, like a plumb bob; said mechanism consisting of, in combination:

- (1) A *pump* attached to a *sectional line or power shaft* extending to the top of the well;
- (2) A *pump casing* enclosing the pump impeller;
- (3) A *water discharge, sectional casing* connected to the pump casing and through which the pumped water passes to the top of the well;
- (4) A *sectional shaft enclosing casing* extending from the pump casing to the top of the well and said *shaft enclosing casing* being adapted to:
  - (a) hold in *alinement* the line shaft by means of suitable *bearings* fixed within said casing at appropriate intervals;
  - (b) to *protect* the line shaft and its bearings



**Plaintiff's Exhibit No. 2.**



from wear or injury by any sand, grit or other bearing destroying detritus carried by the water being pumped; and

- (c) to form a *conduit for lubricant* from the top of the casing down through each succeeding bearing, including the lowest bearing, thus lubricating all said bearings *in series*.

To install such a structure, the *first unit*, embracing (a) the pump impeller casing, (b) the pump impeller therein, (c) a section of water discharge casing, (d) a section of shaft attached to the pump impeller and (e) a section of shaft enclosing casing (having therein a shaft bearing) would be *assembled on the ground*, inserted in the well bore and *held adjacent the mouth thereof* so that the second unit (embracing a section of water discharge casing, a section of shaft and a section of shaft enclosing casing, having therein a shaft bearing), could be joined to the *first unit*, whereupon such two units would be lowered about an unit's length into the well bore and *there held* until the addition of a *third unit* identical with the *second unit*. The successive additions of units, like the second unit, would then proceed until the desired length of structure had been assembled and lowered and the pump be at the desired depth in the well bore, whereupon the whole structure would remain *supported from the top of the well*, hang pendant therein and function properly, *all without the neces-*

*sity of man entering the well either to install, operate or repair the structure.*

It is to be noted that, in such pump structure, the sectional line or power shaft (connecting the pump impeller with the power means on the surface of the ground) is enclosed in a *casing* which performs three distinct functions in reference to (a) *alinement*, (b) protection and (c) lubrication.

In such shaft enclosing casing, shaft bearings, at regular intervals, are mounted. An inspection of the figures of the Layne patent drawings, reproduced on the opposite page, shows that such shaft casing is supported at the top of the well and that it is an *integral* part of the *means* for supporting and suspending every other part of the apparatus located below the top of the well.

In other words, the shaft casing and the water discharge casing form an integral structure, which is supported at the top of the well and, therefore, by reason of gravity, said casings hang in a vertical plane. As the shaft bearings are mounted in the shaft casing, said bearings necessarily are held in vertical alinement. As the shaft passes through such vertically alined bearings it, too, must be held in a vertical line.

Thus, such shaft enclosing casing performs the function of alining the shaft bearings and thereby alining the shaft passing through such bearings. As said by the Circuit Court of Appeals for the Fifth Circuit in the *Van Ness* case:

"The third function performed by the shaft casing of the (Layne) patent in suit is that of *aligning* the bearings and the pump shaft so as to keep the latter in a vertical position in the well."

Such alinement function, of the shaft casing, is a most important and vital one and is one of the features or attributes of Layne's revolutionary invention which distinguishes and differentiates it from all prior art structures.

Judge Dietrich, in the District Court, also found that Layne's shaft enclosing casing performed such alining function. In his opinion herein, he said:

"An essential part of the main problem was to provide bearings to hold the driving shaft in alignment together with means for lubricating them and keeping them free from the sand more or less generally carried in the water. In the inventor's conception, *these three functions were to be performed by the shaft casing.*" (R. 890.)

In his dissenting opinion herein, Judge Gilbert affirmed the correctness of the District Court's said finding which is consistent with that of the Circuit Court of Appeals for the Fifth Circuit in the *Van Ness* and *Getty* cases, *supra*.

*In direct conflict* with the aforesaid respective findings of the Circuit Court of Appeals for the Fifth Circuit and of Judge Dietrich and of Judge Gilbert herein, is the finding herein of Judge Morrow, concurred in by District Judge Wolverton.

The *conflicting* finding herein is expressed by Judge Morrow in the following language:

"It seems clear to us that the alignment is *not* a function of the shaft casing, . . . (R. 1130.) Our conclusion is that the shaft casing has only *two* functions: (1) To protect the shaft and its bearings from the water and sand pumped to the surface, and (2) to enclose the means provided for lubrication of the shaft bearings." (R. 1133.)

The said *conflict*, between the Circuit Court of Appeals' decision herein and the decisions of the Circuit Court of Appeals for the Fifth Circuit, is emphasized by the following remarks of Judge Morrow:

"In *Van Ness vs. Layne*, 213 Fed., 804, the patent was held valid and Claim 20 infringed. In that case the Court *sustained* the claim of the plaintiff that the protecting casing had *three* functions, namely: (1) To exclude water and detritus from the shaft and its bearings; (2) to provide a means of lubricating the bearings of each section of the shaft from the top of the well without removing the apparatus from it; and (3) *to align the bearings and the shaft* so as to prevent lateral displacement in the well and keep the shaft in a vertical position." (R. 1131.)

*It thus appears there is a direct conflict between the decision herein of the Circuit Court of Appeals for the Ninth Circuit and the decisions of the Circuit Court of Appeals for the Fifth Circuit in respect to the "mode of operation" of the Layne mechanism covered by the patent claims in suit.*

Furthermore, in respect to such *mode of operation* of Layne's device, there is a similar conflict between

the respective views of the two Judges, rendering the decision herein of the Circuit Court of Appeals, and of Circuit Judge Gilbert dissenting therefrom, and of District Judge Dietrich, overruled thereby.

*In respect to the construction and scope of the three Layne patent claims, involved herein, there is also a direct conflict between the decisions respectively rendered by said two Circuit Courts of Appeals and between the views of said two Judges, rendering the decision herein of the Circuit Court of Appeals, and the views respectively expressed by Judge Gilbert, in his dissenting opinion, and by Judge Dietrich, in rendering the District Court's decision herein.*

Layne's generic, revolutionary invention is covered by and broadly expressed in said three *generic* claims which read as follows:

"9. In well mechanism the combination with a pump casing, of a rotary pump of a jointed pump shaft and a closed casing surrounding the pump shaft from the pump to the top of the well.

13. The combination with a pump and its actuating shaft of a sectional casing therefor provided at each end of each section with a fixed block with bearings for the shaft, the casing being closed at the top and provided with an air vent.

20. The combination of a well casing, a rotary pump therein, and a line shaft for the pump entirely closed off from the water in the well."

The casing, enclosing the shaft from the pump impeller casing to the top of the well and designated as the "shaft casing," is an element of each of said claims.

In Claim 9, said *shaft casing* is described as "*a closed casing surrounding the pump shaft from the pump to the top of the well.*"

In Claim 13, said *shaft casing* is described as a "*sectional casing therefor,*" that is, a sectional casing for the actuating shaft previously mentioned in the claim.

In Claim 20, the said *shaft casing* is referred to in the expression: "*A line shaft for the pump entirely closed off from the water in the well.*"

The alinement function of said *shaft casing* has been discussed.

The said casing also protects the shaft and its bearings from the water being pumped and the sand and detritus carried thereby.

The said *shaft casing* also forms a *conduit* into which, at the top of the casing adjacent the mouth of the well bore, lubricant is fed and such lubricant flows, by gravity, down through the casing lubricating, in series, the shaft bearings mounted in such casing.

From a practical and commercial point of view, it is quite immaterial whether the *shaft casing* be completely closed, at the bottom thereof, or permits the escape therefrom of the lubricant which, on reaching the bottom of the casing, has completely performed its function of lubricating the shaft bearings. Furthermore, the downward pressure of the lubricant, within the *shaft casing*, and its escape, from the bottom thereof, co-operate with the casing in preventing the entrance, into the casing and access to the shaft

bearings, of the water being pumped and the sand and detritus carried thereby.

In other words, the shaft casing, notwithstanding it is *not* completely closed at the bottom thereof, is capable of practically performing the two functions of protecting the shaft bearings, from the destructive action of the sand and detritus in the water being pumped, and of forming a *conduit* for the lubricant.

*Therefore, in construing Layne's patent claims, the Circuit Court of Appeals for the Fifth Circuit did not limit them to a structure in which the shaft casing was completely closed at the bottom thereof.*

The Van Ness pump structure was *held to infringe* the Layne patent, *notwithstanding* that the Van Ness shaft casing was *not* completely closed at the bottom thereof and, therefore, *permitted the escape of lubricant therefrom* and, when the pump was idle, permitted water to enter therein. Regarding infringement of the Layne patent by the Van Ness pump, the Court of Appeals for the Fifth Circuit said:

"The defendant denies that his pump shaft casing performs any one of the three functions attributed to that of the patent in suit. He denies that it is a closed casing in any true sense. It seems not to be closed so far as concerns the entrance of air. *However, the proper interpretation of the words 'closed casing' is a closure only against what is necessary to be excluded for the successful operation of the invention, and that, in this case, as we understand it, is water and sand, because when not excluded the first corrodes and the second wears the shaft and its bearings.*



It seems also true that the closure against water is only partial, since the lower bearing of defendant's apparatus is not within the inclosing casing, though the intermediate and top bearings are. So it seems doubtful whether the defendant's pump casing keeps the water from the shaft and bearings when it is not in operation, and the argument is that in the rice country, where it is principally used, it remains out of service nine months of the year. For these reasons, it is argued that the defendant's casing is not a closed one, even against water and sand. However, the record shows that protection against water and sand is afforded by defendant's casing to all but one of the bearings and to the shaft in the same degree as by that of the patented casing, at least during the period of the pump's operation, and that the protection afforded by defendant's casing is different only in degree from that afforded by the patented casing. The closure in the patented casing is effected by stuffing boxes *as well as by the presence and downward pressure of the oil between the bearings and the shaft*, which serves to keep the water from pressing upward into the shaft casing between the bearings and the shaft. The closure in defendant's casing is effected *by the last method only*, and without the use of packing or stuffing boxes. Each casing serves to effect at least a partial closure against the water and sand. The difference is one of method and degree only, and for that reason it seems that the defendant's casing infringes this element of the patent, at least to some extent.

The second function of the patented casing is that of providing lubrication for the bearings. In *both* casings, that of defendant as well as that of complainant, *the oil is put in the apparatus at the top and passes through the bearings from the*

*top through the intermediate to the lower bearing, being retained for a time above each bearing and serving in this way not only to lubricate each bearing, but also to help close the shaft casing against the ingress of water and detritus. The defendant's casing and that of the patent in suit perform this function to substantially the same extent, though the respective bearings as to the means for the flow of the oil through them are somewhat differently constructed."*

In the *Getty* case, *supra*, the Circuit Court of Appeals for the Fifth Circuit again construed the Layne patent claims as *not* being limited to a structure embodying a shaft casing completely closed at the bottom thereof. In that case, the Court said:

*"The mere fact that Getty's closure is not complete, or not as complete and effective as that of Layne's, is an unimportant fact."*

To the same effect are the findings herein of Judge Dietrich who also found that said claims were *not* limited to a shaft casing completely closed at the bottom thereof and from which no lubricant could escape. On the contrary, the trial Judge found, *as a fact*, that, in the Layne mechanism as disclosed in the Layne patent, the shaft casing *was not and could not be* made absolutely closed at the bottom thereof and *that lubricant would necessarily escape therefrom*. On this point, Judge Dietrich found as follows:

*" . . . It was undoubtedly Layne's desire and purpose in so far as possible to exclude the water*

from the shaft casing, but perfect mechanical inclosure of the shaft is, of course, unattainable; it must protrude from the stationary casing to connect with the rotating propeller, at a point where the pressure of the water is the greatest, and a bearing at that point so close fitting as to entirely exclude the water could not be lubricated, and hence would be impracticable. The provision made by the patent is for a long bearing equipped with a stuffing-box, which, *in conjunction with the down pressure of the oil in the casing*, serves under ordinary operating conditions, as an effective barrier to the sand, if it does not entirely exclude the water. . . .

In operation the oil is fed into the shaft casing above the uppermost bearing, and running down in the space between the casing and the shaft passes through the bearing, and thence down the casing through the several bearings, lubricating all in series. Manifestly, if the oil is fed into the casing faster than it is dissipated, the vacant space will in time fill up and the column of oil thus formed will press upon and *have a tendency to escape out of the lowest bearing, thus co-operating with the stuffing-box in excluding the water.* (R. 890.) In the actual operation of the *plaintiff's* mechanism *there is necessarily some escape of thin oil* through the bottom bearing; for, as already explained, a perfect closure at this point cannot be maintained. (R. 895.)

The said *findings*, of the District Court, were affirmed by Circuit Judge Gilbert who, in his dissenting opinion, said:

"In both the appellee's (Layne) and appellants' mechanisms the oil is introduced at the top in substantially the same manner, and by gravity it

traverses the entire length of the shaft, thereby lubricating all the bearings. *In both there is some escape of oil through the lowest bearing.* The contention that the two systems are differentiated in that the appellee's lubricating system is static, while that of the appellants' is circulatory *is not sustained by the proofs.* In the appellants' mechanism, the shaft casing being made impervious to water and packed with hard cup grease a distance above and below each bearing, the ingress of water is prevented, and the movement of the lubricating oil is impeded, so that there is no substantial difference in the operation of the two lubricating systems. Both use a closed casing surrounding the pump shaft from the pump to the top of the well, the casing being sufficiently closed to allow the feeding of a lubricating fluid down through the same to the various bearing parts for the shaft therein. Both accomplish the same result by substantially the same means, operated in substantially the same way. The fact that the appellants' static lubricants are supplemented by the use of an emulsifying oil is unimportant. *The fact that in the appellants' mechanism more oil escapes from the lowest bearing than in the appellee's is also unimportant.* The ultimate disposition of the lubricant after its office is fulfilled is immaterial. These differences do not enable the appellants to appropriate the substance of the appellee's invention." (R. 1149.)

*In direct conflict* with the foregoing construction of Layne's patent claims by the Circuit Court of Appeals for the Fifth Circuit and by the District Court herein and by Circuit Judge Gilbert, in his dissenting opinion herein, the Circuit Court of Appeals for the Ninth Circuit herein construed the

Layne patent claims, in suit, *as being limited to a structure in which no lubricant escaped from the bottom of the shaft casing.*

Admittedly, respondents' structure embraces all the mechanical features and elements specified in said several claims and, admittedly, the escape of such lubricant from the shaft casing is immaterial from a practical or commercial point of view as, in all the pumps sold by both petitioner and respondents, there is such an escape of lubricant.

The finding of non-infringement herein was, therefore, based on the reading into the said generic claims of a limitation relating to a wholly immaterial feature. In so *narrowly* construing said claims, his Honor, Judge Morrow, said:

"... but the *controlling* question still remains to be determined. Does the lubricating oil introduced into the defendants' shaft casing pass down through the bearings and after being used and spent, *finally pass out at the bottom of the shaft into the well proper* through a channel or auxiliary conduit constructed for that purpose? *If it does, then it is not the same mechanical device for lubrication claimed and specified in the plaintiff's patent.*" (R. 1142.)

Having so stated the "*controlling question*" in the case and having so construed and *limited* said claims, the Circuit Court of Appeals herein adjudged respondents' device not to infringe said claims *for the sole reason that some (not all) of the lubricant, after*

*performing its lubricating function, escaped from the bottom of respondents' shaft casing.*

In other words, the finding of non-infringement herein was based *solely and wholly* upon the immaterial and unimportant "*differences*" referred to in the above quoted findings of Judge Gilbert with the result that, *in the Ninth Circuit*, Layne's patent does *not* cover and, *in the Fifth Circuit*, does cover a structure embracing a shaft casing from which lubricant escapes from the bottom thereof.

And said finding herein of non-infringement is *supported* by the opinion of a Circuit Judge, concurred in by a District Judge, and *controverted* by the opinion of a Circuit Judge, concurred in by a District Judge who tried the case in open Court. Therefore, if, in respect to the said hearings of this case, District Judge Wolverton had been the trial Judge and District Judge Dietrich had been sitting in the Circuit Court of Appeals, where he frequently sits, the decision herein would have been in petitioner's favor, according to the respective views so expressed by said four Judges. Petitioner respectfully submits that such a situation justifies an authoritative review and decision herein by this Court.

From the foregoing, it appears that petitioner's patent discloses an invention which revolutionized the well-drilling industry and has gone into general use; that said patent, like all others respectively covering valuable contributions to the arts, has been extensively infringed; that said patent has been liberally con-

strued and the claims thereof accorded a broad scope by the Circuit Court of Appeals for the Fifth Circuit whereas the Circuit Court of Appeals for the Ninth Circuit, by a divided Court, has herein read into and limited said claims to a wholly immaterial feature never present in any structure ever sold by Layne or by any owner of the Layne patent or of rights thereunder; and that there are now pending in different Circuits numerous suits for the infringement of the Layne patent.

In view of the foregoing, it is of importance and to the interest of the public that there be uniformity of decision in respect to this Layne patent and that the scope thereof, in all nine circuits, be determined by the authoritative decision of this Court.

WHEREFORE, because of the gravity and importance of the questions involved herein and *in the interest of uniformity of decision*, your petitioner respectfully prays that a writ of certiorari may be issued out of and under the seal of this Court, directed to the Judges of the United States Circuit Court of Appeals for the Ninth Circuit and commanding them and each of them to certify and send to this Court on a day certain to be therein designated, a full and complete transcript of the record and proceedings of the said Circuit Court of Appeals in the case lately pending therein entitled, "*Western Well Works, Inc., et al., appellants, vs. Layne & Bowler Corporation, appellee, No. 3627,*" to the end that the judgment or decree of said Circuit Court

of Appeals in said case may be reviewed as provided by the statutes in such cases made and provided, and that your petitioner may have such other and further relief or remedy in the premises as to this Court may seem appropriate and in conformity with the law.

And your petitioner will ever pray.

LAYNE & BOWLER CORPORATION.

By FREDERICK S. LYON,  
WILLIAM K. WHITE,  
LEONARD S. LYON,

As counsel and attorneys for Petitioner.



FREDERICK S. LYON,  
WILLIAM K. WHITE,  
LEONARD S. LYON,  
Counsel for Petitioner.

State of California, City and County of San  
Francisco.—s. s.

WILLIAM K. WHITE, being first duly sworn,  
deposes and says that he is counsel for the petitioner,  
Layne & Bowler Corporation; that he has read the  
foregoing petition and the matters of fact stated  
therein are true to the best of his knowledge, in-  
formation and belief.

WILLIAM K. WHITE,

Subscribed and sworn to before me this 16th day  
of February, 1922.

W. W. HEALEY,  
Notary Public in and for the City and County of  
San Francisco, State of California.

In our opinion the foregoing and annexed petition  
for *certiorari* is well founded as to matters of fact  
and as to matters of law.

FREDERICK S. LYON,  
WILLIAM K. WHITE,  
LEONARD S. LYON,  
Counsel for Petitioner.

# In the Supreme Court

OF THE  
UNITED STATES

LAYNE & BOWLER CORPORATION,

*Petitioner-Plaintiff,*

vs.

WESTERN WELL WORKS, INC. (a Corporation), ROTARY DRILLING AND DEVELOPMENT COMPANY (a Corporation), STANLEY M. HALSTEAD, P. E. VAUGHAN and ALLEN W. ROSS,

*Respondents-Defendants.*

BRIEF IN SUPPORT OF PETITION FOR  
WRIT OF CERTIORARI

## PRELIMINARY REMARKS

The conflict, between the respective decisions of the Circuit Courts of Appeals for the Fifth and Ninth Circuits in regard to the Layne patent, has been pointed out in the annexed petition and is apparent from the quotations from said decisions set forth in such petition.

The said conflict is in relation to the *scope* of

Layne's patent claims and it was only by *narrowing* the scope, accorded to said claims by the Circuit Court of Appeals for the Fifth Circuit, that the Circuit Court of Appeals for the Ninth Circuit was herein able to find respondents' structure to be outside the monopoly granted by said claims.

As construed by the Circuit Court of Appeals for the Fifth Circuit, the Layne patent would be infringed by respondents' structure.

We understand the well established rule to be that this Honorable Court will always grant a writ of certiorari where such a conflict exists.

Although this conflict is apparent on the face of the said quotations from such decisions, nevertheless we shall herein discuss, more at length, the situation presented by the annexed petition.

The finding of non-infringement herein is *wholly based* upon two findings in conflict with the findings of the Circuit Court of Appeals for the Fifth Circuit in respect to two controlling factors which respectively relate to the "*alignment function*" of the shaft casing and to the *bottom closure* of such shaft casing in respect to the escape of lubricant therefrom.

(a) The Circuit Court of Appeals for the Fifth Circuit adjudged that Layne's shaft casing performed the function of *aligning* the shaft bearings and shaft.

The Circuit Court of Appeals for the Ninth Circuit herein adjudged that Layne's shaft casing did *not*

perform such *aligning* function and made use of this *conflicting* finding as a basis for narrowing the scope of Layne's contribution to the art and for narrowing the scope of his patent claims covering such contribution.

(b) The Circuit Court of Appeals for the Fifth Circuit adjudged Layne's patent claims covered a structure in which lubricant escaped from the bottom of the shaft casing embraced in such structure.

The Circuit Court of Appeals for the Ninth Circuit herein adjudged said claims did *not* cover a structure in which lubricant escaped from the bottom of the shaft casing embraced in such structure.

And, accordingly, respondents' structure was adjudged not to infringe Layne's "*revolutionary*" patent *solely and wholly* for the reason that a *part* (not all) of the lubricant used therein escaped from the bottom of the shaft casing.

It will not be necessary to describe the respondents' structure because the finding of non-infringement was based *wholly* on such escape, from respondents' shaft casing, of *some* of the lubricant used therein. Obviously, such structure embraces all of the mechanical elements of the respective combinations of Claims 9, 13 and 20, and the Circuit Court of Appeals did not *even* attempt to differentiate such structure from Layne's structure other than in respect to the escape of *some* lubricant from respondents' shaft casing. As

said by Judge Morrow, in speaking for that Court, the "*controlling question*" was whether or not any lubricant escaped from respondents' shaft casing. "*If it does,*" said he, "then it is not the same mechanical device for lubrication claimed and specified in the plaintiff's patent" (R. 1142).

At this time it may be well to point out that Layne's patent claims do not describe or cover or attempt to describe or cover any *method or process* of lubrication as necessarily implied in the foregoing remarks of Judge Morrow. Said claims respectively describe and cover combinations of *mechanical elements*, one of which mechanical elements is a "*shaft casing*" adapted to perform three functions in the operation of the device. To perform two of said functions, to wit: the function of protecting the shaft bearings from the destructive action of the detritus in the water being pumped and the function of forming a *conduit* for the lubricant used in lubricating the shaft bearings, such shaft casing must be sufficiently closed, at the bottom thereof, to practically accomplish the desired objects. However, it *need not be*, as found by the Circuit Court of Appeals for the Fifth Circuit, *and cannot be*, as found by the trial Judge herein, absolutely closed at the bottom thereof. It need not be absolutely closed because, as found by the Circuit Court of Appeals for the Fifth Circuit, *the column of lubricant therein co-operates with the casing in excluding water and detritus therefrom.*

"However, the proper interpretation of the words 'closed casing' is a closure only against what is necessary to be excluded for the successful operation of the invention. . . ." (C. C. A. for Fifth Circuit in *Van Ness* case, *supra*).

"The mere fact that Getty's closure is not complete, or not as complete and effective as that of Layne's, is an unimportant fact" (C. C. A. for Fifth Circuit in *Getty* case, *supra*).

" . . . perfect mechanical inclosure of the shaft is, of course, unattainable; it must protrude from the stationary casing to connect with the rotating propeller, at a point where the pressure of the water is the greatest, and a bearing at that point so close fitting as to entirely exclude the water could not be lubricated, and hence would be impracticable. . . . Manifestly, if the oil is fed into the casing faster than it is dissipated, the vacant space will in time fill up and the column of oil thus formed will press upon and have a tendency to escape out of the lowest bearing, thus co-operating with the stuffing-box in excluding the water. . . . In the actual operation of plaintiff's mechanism there is necessarily some escape of thin oil through the bottom bearing; for, as already explained, a perfect closure at this point cannot be maintained" (Trial Judge Dietrich, R. 890, 895).

As found by Circuit Judge Gilbert:

"The fact that in the appellants' mechanism more oil escapes from the lowest bearing than in the appellee's is also unimportant. The ultimate disposition of the lubricant after its office is fulfilled is immaterial. *These differences do not enable the appellants to appropriate the substance of the appellee's invention*" (R. 1149).

## I

THE LAYNE PATENT DISCLOSES A FUNDAMENTAL GENERIC INVENTION WHICH ACCOMPLISHED A REVOLUTION IN THE PUMP ART AND STANDS AT THE HEAD OF A NEW CLASS THEREIN.

The Layne "patent is of a *fundamental, generic character*," said Judge Dietrich herein.

*"The Layne patent . . . did accomplish a revolution in the well drilling industry,"*

said the Circuit Court of Appeals for the Fifth Circuit.

Prior to the introduction of Layne's revolutionary invention, the general type of pump installation was one involving the digging of an open pit and the mounting of the pump *on the bottom of the pit*. Such a pit construction is illustrated in "Plaintiff's Exhibit No. 2" (R. 915), reproduced in the annexed petition.

Mr. Layne had for years been installing pumps. He was thoroughly familiar with the dug pit installations—its dangers and inefficiencies. The problem, which confronted him and which he so successfully solved by his fundamental invention, was:

How could a mechanism be organized that would be efficient, practical and durable, and at the same time eliminate the necessity of man going down into the dug pit, and eliminate the necessity of the installation of the pump on the bottom of the pit or on the framework in the pit? How could he obviate

- (1) the necessity of digging the pit, and thereby eliminate
- (2) the risk necessarily assumed by man due to
  - (a) danger of caving in while the pit was being dug or while the men worked in the pit boarding it up or installing the pump; and
  - (b) the risk of personal injury or loss of life (frequent with the dug pit construction) due to the necessity of man descending into the pit to lubricate, make necessary repairs, etc.?
- (3) How could he construct and assemble on the ground a pump structure of the necessary great length (Layne pump structures 400 to 800 feet long, have been installed) and still be able to insert it in the small bore of a well?
- (4) How could he vary the length of such pump structure, after installation, in order to raise or lower it according to any variation in the level of the water in the well?
- (5) How could he protect the many necessary bearings for the long pump operating shaft so that the sand and other destructive detritus carried by the water being pumped would not cut out or destroy such bearings?
- (6) How could he assemble the bearings and pump shaft in proper relation and maintain the bear-



ings in such relation without the necessity of man descending into the well hole?

- (7) How could he provide for the alinement of such a long pump shaft in the well?
- (8) How could he efficiently lubricate the many bearings required in such a structure?

As said in the *Van Ness* case, there was a long "*unfilled want*" for just such a structure as that invented by Mr. Layne. Respondents herein proved that *forty-three years of development in this art*, prior to Layne's advent therein, had not filled such want.

Layne's solution of the problem embraced a broad, generic "*idea of means*," a fundamental invention.

He conceived the idea of supporting the whole structure at the top of the well so that it would hang pendant, like a plumb-bob.

He conceived the basic idea that such a structure, to be practical and, notwithstanding its great length, be capable of insertion in the small bore of a well, must be built up of many units, so that, *unit by unit*, the structure could be assembled at the mouth of the well-bore and, after the addition of each succeeding unit, be lowered a unit length into the well.

He appreciated that such a sectionalized structure, made up of as many units as the depth of the well required, would also necessarily be adapted to be lowered or raised, according to any variation in the level of the water in the well, by simply adding a unit to or subtracting a unit from the structure.

His said idea of assembling the pump and its mechanism, unit by unit, at the top of the well and lowering it, unit by unit, into the well while supporting it pendant from the top of the well was revolutionary. It *pointed* to a solution of the dug pit problem; no man need enter the pit. In fact, no pit need be dug; a small bore was all that was required to accommodate such a pendant structure.

However,\* said idea did not solve the problem; it *merely pointed out the right road to be traveled in order to reach the desired goal*. Many additional problems obstructed such road; problems which had baffled all prior inventors in this art and caused many to seek entirely different roads, leading only to failure.

Some of these additional problems confronting Mr. Layne were:

(a) How could he provide the many necessary bearings to keep the pump shaft in alinement?

(b) How could he insert and hold such bearings in position along the shaft and hold them in alinement?

(c) How could he lubricate such bearings?

(d) How\* could he protect the bearings from the destructive action of the sand, etc., in the water being pumped?

All these things had to be provided for in such manner that all the parts of the structure could be assembled, unit by unit, at the top of the well and,

when lowered into the well, would function properly without the necessity of man entering the well for any purpose whatsoever.

Without a solution of these problems, Layne's underlying idea of assemblage and installation from the top of the well and of pendant support could not be realized.

These additional problems were solved by Mr. Layne's conception of *a sectional casing enclosing the line or power shaft from the top of the pump to the top of the well.*

Such a shaft enclosing casing could be made up of sections of the desired length so that a shaft bearing could be inserted at the end of each length. Such a shaft enclosing casing could be connected to the *water-discharge* casing and thus form an integral structure adapted to be supported at the top of the well and hand pendant like a plumb-bob.

The shaft enclosing casing, being an integral part of such pendant structure, hanging like a plumb-bob, would itself be maintained in *alinement* and thus would hold, *in alinement*, the shaft bearings and thereby the shaft.

By so mounting the many shaft bearings in such a shaft enclosing casing, Mr. Layne was able to utilize said casing as a means of *protecting* the bearings from the destructive action of the sand, etc., in the water being pumped.

Mr. Layne also conceived the idea of utilizing this same shaft enclosing casing as a means or *conduit*

for conveying lubricant to each of the bearings therein by providing for the feeding of lubricant into the casing above the topmost bearing therein so that such lubricant would, by gravity, circulate or pass down between such bearing and the shaft and between each succeeding bearing and the shaft, thus lubricating all the bearings *in series*.

It is thus seen that Layne's shaft enclosing casing performs the following three functions:

- (1) *Alinement* of shaft bearings;
- (2) *Protection* of shaft bearings from the destructive action of the sand, etc., in the water being pumped; and
- (3) *Conduit* for lubricant for shaft bearings.

Having solved the problems of *alinement*, *protection* and *lubrication* by means of his shaft enclosing casing, Mr. Layne was then in a position to carry out his underlying idea of a structure built up of units adapted to be assembled at the top of the well and, when lowered into the well, to be supported from the top and hang pendant.

Such a structure, expressing and embodying Layne's generic invention, embraces:

A deep well pump mechanism, adapted to be assembled, *unit by unit*, at the mouth of the well bore and be successively lowered therein *a unit's length* after the addition of each succeeding unit and, when completely assembled and lowered, to *hang pendant*

from the surface, like a plumb-bob; said mechanism consisting of, in combination:

- (1) A *pump* attached to a sectional line or power shaft extending to the top of the well;
- (2) A *pump casing* enclosing the pump impeller;
- (3) A *water discharge, sectional casing* connected to the pump casing and through which the pumped water passes to the top of the well;
- (4) A *sectional shaft enclosing casing* extending from the pump casing to the top of the well and said *shaft enclosing casing* being adapted to:
  - (a) Hold *in alinement* the line shaft by means of suitable *bearings fixed* within said casing at appropriate intervals;
  - (b) To *protect* the line shaft and its bearings from wear or injury by any sand, grit; or other bearing destroying detritus carried by the water being pumped; and
  - (c) To form a *conduit for lubricant* from the top of the casing down through each succeeding bearing, including the lowest bearing, thus lubricating all said bearings *in series*.

Having conceived his broad, generic "idea of means" or invention, it was then necessary for Mr. Layne to decide, according to his own judgment,

upon the best *species* or *form* in which to express his generic "*idea of means*."

Every invention comprises an abstract "*idea of means*" expressed in concrete form. There is no idea that cannot be expressed in a number of ways, each expression thereof being the equivalent of every other expression of the same idea. This is universally true. For instance, the idea that an object is round can be expressed in a number of ways. The same idea may be expressed thus: Every point on the object's surface is equally distant from the center of the object. The same idea may be expressed in any of the foreign languages.

*It follows, therefore, that there can be no generic expression of a generic idea.*

This is true in connection with mechanical inventions. Where an inventor conceives an "*idea of means*," it is always possible to express said idea of means in many different concrete forms, each the equivalent of every other. This is true, no matter how narrow and restricted the idea of means may be.

It is, however, obvious that a broad, comprehensive generic "*idea of means*" can be expressed in a greater number of ways than can a narrow, restricted "*idea of means*," hence the so-called rule of law that "*the range of equivalents varies with the scope of the invention.*"

As a matter of fact, said statement is not a "*rule of law*" but a "*law of nature.*" Before any patent laws were ever enacted, it was true that a broad

"*idea of means*" or, in other words, a *generic* invention, could be expressed in concrete form in more equivalent ways than could a narrow "*idea of means*" or specific invention.

Congress has recognized the existence of this "*law of nature*" that every invention can be expressed in many different concrete forms, each the equivalent of every other. We, therefore, find in Section 4888 of the Revised Statutes the following provision as to what an inventor must embody in his application for letters patent:

" . . . in case of a machine, he shall explain the principle thereof and the *best mode* in which he has contemplated applying that principle, . . . "

According to this section, an inventor is only required to describe, in his application for a patent, the "*best mode*" of embodying his "*idea of means*" in concrete form.

The Patent Office rules are to the same effect and the Patent Office does not require and does not permit an applicant to show, in his application, every possible form in which his invention can be embodied.

In view of the foregoing, an inventor need only show in his patent his *preferred form* of embodiment of his invention. When he has done this, he is *entitled* to *claim* his *actual invention* in whatever form it can be embodied.

Mr. Layne's *preferred form* of embodiment of his generic invention is illustrated in Figures 1, 2, 5, 7,

8 and 9 of his patent drawings reproduced in the annexed petition.

Figure 1 discloses an exterior view of the *shaft enclosing casing* 20, extending from the top of the well to the pump impeller casing 21, together with the *water discharge casing* or outlet pipe 23. It will be noted each of these casings is made up of a number of *sections*. As said by Layne: "The outlet pipe 23 is also preferably made in sections to correspond with the sections of the pump shaft casing" (p. 2, l. 108).

It will be also noted that the *shaft enclosing casing* 20 and the *water discharge casing* or outlet pipe 23 are *bound together* to form an *integral structure* which is supported at the top of the well in frame work 24 and thus said *integral structure* hangs *pendant*, like a plumb-bob, in the well-bore, which is lined with the casing 16.

As said on page 1 of Layne's patent, line 104:

"As shown in Figure 2, the shaft casing 20 and the outlet pipe 23 are *bound together* by means of the block-and-strap arrangement 26. These connecting devices are distributed at intervals along the length of the shaft casing."

In this Figure 1, a portion of one of the line shaft sections 39 is seen projecting from the top of the shaft casing and extending up to the drive pulley 25.

In Figure 1, the water discharge casing or outlet 23 is illustrated as *eccentric* to the shaft casing although, on page 2, line 124 of his patent, Mr.



Layne states the water discharge casing may be *concentric* with the shaft casing. This, however, is a mere matter of detail or form.

Also, in Figure 1, the pump mechanism is disclosed installed in connection with an old pit or chamber 15. Said pit serves no purpose and performs no function and Mr. Layne states, on page 1, line 88, that the well casing 16 may be extended to the surface and thus the pit or chamber 15, be dispensed with.

1. ALINEMENT—Figures 7, 8 and 9 disclose the interior of the sectional shaft casing 20 including the sectional shaft 39' and the shaft bearings 47', respectively supported in the shaft casing at the respective ends of adjacent shaft casing sections.

As said shaft casing 20 is an *integral part* of the whole structure which hangs *pendant*, like a plumb-bob, the *shaft casing* itself will so hang and thus hold in *alinement* the shaft bearings mounted within the casing and thereby maintain the shaft in *alinement*.

2. LUBRICATION—Pipe 52 is a means by which the lubricant can be fed into the shaft casing above the first shaft bearing therein. Such lubricant will, by gravity, flow or circulate down through such first bearing and through each succeeding bearing within the shaft casing and finally pass out of the casing, at the bottom thereof, and into the pump casing 21, thus lubricating all the shaft bearings, in series. In such series lubrication of all the bearings therein,

the shaft enclosing casing merely functions as a *conduit for the lubricant* which enters the upper end thereof and passes down there through and through each bearing therein.

In order that the lubricant may so flow, *by gravity*, down and through each of the bearings within the shaft casing, an air-vent is provided at the top of the casing. The reason for having such a vent or air opening in the casing above the lubricant is precisely the same reason as that which prompts the housewife, when drawing coal oil from the spout at the bottom of a five-gallon coal oil can, to make a hole in the top of the can to admit air above the coal oil and thus equalize the air pressure above and below the oil. If this were not done, a vacuous or no atmospheric pressure condition would be created above the oil in the can as the oil level was lowered. As the oil, at the spout of the can, would be subjected to full atmospheric pressure it is apparent the oil would not freely flow out of the spout if the top surface of the oil, in the can, were not likewise subjected to an equal atmospheric pressure. As defined in the Century Dictionary and Cyclopedia a vent is "The opening in the top of a barrel to allow air to pass in as the liquid is drawn out." In the Layne structure, air will pass into the casing either through the stuffing-box 50, at the top of the casing, or through pipe 52, if the cap thereon be only loosely screwed on the pipe. Of course, this is a mere detail requiring no explanation to one skilled in the art and

attempting to practice the Layne invention as disclosed in his patent.

3. PROTECTION—In Figure 7, the stuffing-box 50 is illustrated as a closure means for the shaft enclosing casing at the top thereof. In Figure 5, a stuffing-box 40 is illustrated as a closure means for the shaft enclosing casing at the bottom thereof. According to the proofs and, as is well known in the world of mechanics, a stuffing-box operates as a bearing and, when used in connection with a high speed rotating shaft, the stuffing material therein cannot be maintained in such close relation with the shaft as to prevent the passage of all liquid between the stuffing and shaft. Like every other type of bearing, the stuffing must be lubricated or it will heat and burn, thus being destroyed.

Therefore, the lubricant, fed into the upper end of the shaft enclosing casing, will circulate or flow down through each succeeding bearing therein and a substantial portion thereof, if not all thereof, will pass through stuffing-box 40 into the pump casing 21.

As said shaft casing encloses the shaft and its bearings from the pump casing to the top of the well, it will be noted the only passage, through which the water being pumped and the detritus therein can enter the shaft casing, is the passage from the pump casing up along the shaft through stuffing-box 40 and between the shaft and the lowest bearing 47 in the shaft casing.

Any *upflow* of such water and detritus through such passage will be effectually obstructed by the said bearing and the stuffing-box and by the *downflow* of oil therethrough.

It is thus apparent that Layne's shaft enclosing casing, *in co-operation with the downflow of oil therein*, performs the function of protecting the shaft bearings from the destructive action of the sand and other detritus carried by the water being pumped.

The foregoing elements and features constitute Layne's *preferred form of embodiment* of his *generic* invention.

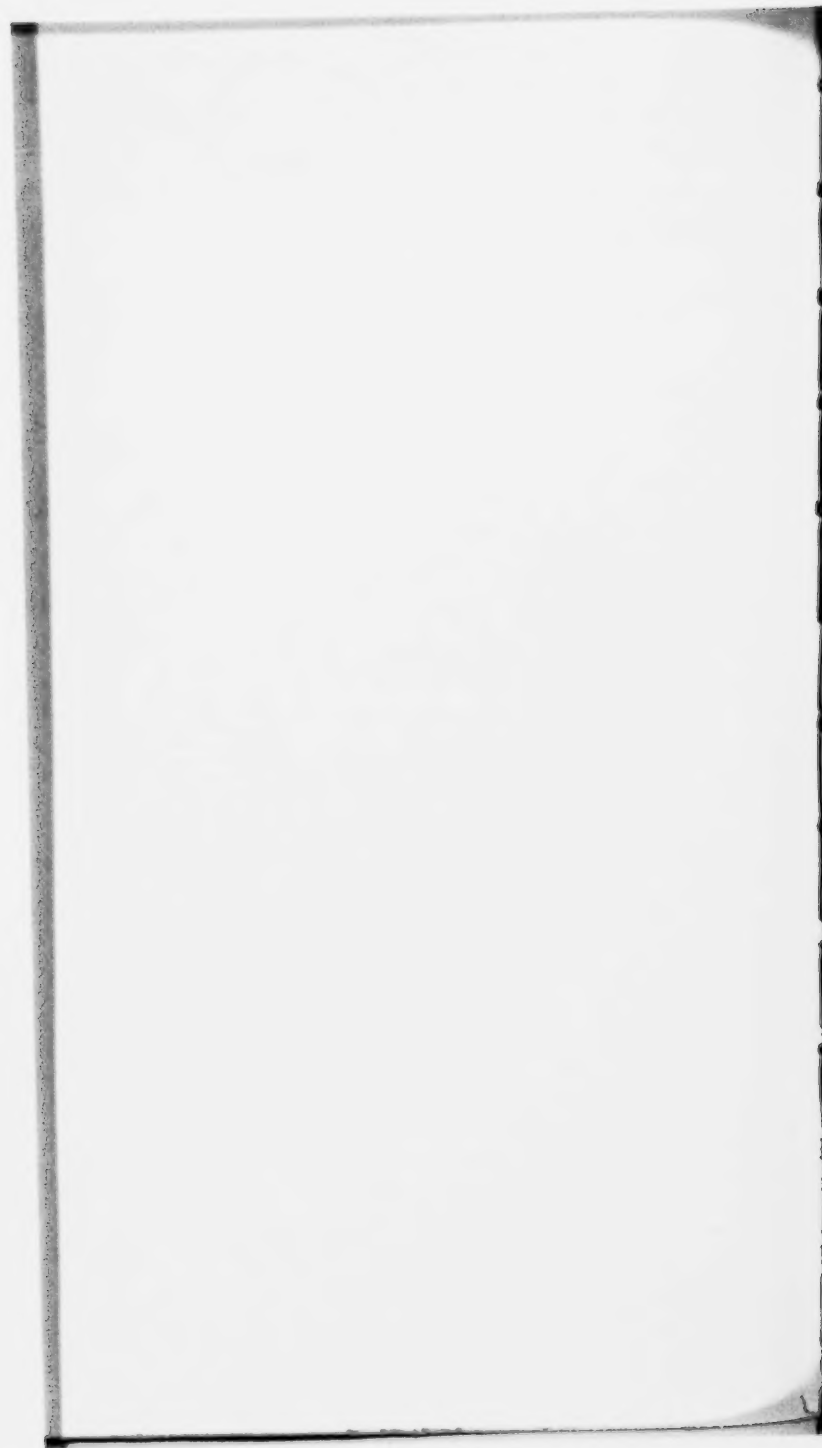
The said elements and features constitute Layne's broad and revolutionary contribution to the art and form the basis for the wonderful commercial success of the Layne invention.

*The said elements and features constitute a complete operative structure.* No other element, no adjunct and no subsidiary feature, described in the Layne patent, is essential to the operativeness of the above-described combination as an expression of Layne's *generic* "idea of means."

DECISION OF CIRCUIT COURT OF APPEALS FOR FIFTH  
CIRCUIT IN VAN NESS CASE, 213 FEDERAL REPORTER  
804 AND IN GETTY CASE, 262 FEDERAL REPORTER  
141.

In order that your Honors may know precisely what pump structure was held to infringe in the *Van Ness* case, we reproduce on the opposite page a drawing of the Van Ness pump. The original cut, of which this drawing is a reproduction, appears opposite page 73 of the Brief filed in the Circuit Court of Appeals by the appellant, Marvin B. Van Ness. The opinion of the Court of Appeals, in the *Van Ness* case, shows this drawing was accepted as correctly disclosing the Van Ness pump.

By reference to this drawing, it will be seen the Van Ness pump embraced a structure hung *pendant* from the top of the well and including a *sectional shaft* enclosed in a *sectional casing* provided with *intermediate shaft bearings* and said casing being surrounded by the water discharge casing communicating with the discharge outlet of the pump casing. The lubricant is fed to a point above the first shaft bearing and circulates or passes, *by gravity*, between such bearing and the shaft, between each successive bearing, within the shaft enclosing casing, and the shaft and finally between *the long sleeve bearing* and shaft into the pump casing, thus lubricating all said bearings, in series.



It will be noted that the lower *thrust* bearing does not bear on its seat and, therefore, offers no *mechanical obstruction* to the passage of the lubricant down between the *long sleeve bearing* and the shaft. Conversely, said *thrust* bearing offers no *obstruction* to the passage of water up between the long sleeve bearing and shaft and then out into the shaft enclosing casing. Of course, the "*long sleeve bearing*," itself, offers a mechanical obstruction to the flow of water and detritus upward between it and the shaft. This "*long sleeve bearing*" plus "*the downpressure and downflow of lubricant*" prevent the water being pumped and the detritus carried thereby from passing upward between the long sleeve bearing and shaft and thus coming into contact with and destroying the *intermediate* bearings located within the shaft enclosing casing.

The Court of Appeals for the Fifth Circuit held this Van Ness pump infringed because it embodied the *substance* of Layne's idea of means and embraced a shaft enclosing casing performing the three functions of (a) *protection*, (b) *conduit for lubricant* and (c) *alinement*.

(a) *Protection in Van Ness pump*: Regarding the protection afforded by the shaft enclosing casing against the destructive action of the detritus carried by the water being pumped, the Court said:

"The defendant denies that his pump shaft casing performs any one of the three functions attributed to that of the patent in suit. He denies that it is

a closed casing in any true sense. It seems not to be closed so far as concerns the entrance of air. *However, the proper interpretation of the words 'closed casing' is a closure only against what is necessary to be excluded for the successful operation of the invention, and that, in this case, as we understand it, is water and sand, because when not excluded the first corrodes and the second wears the shaft and its bearings. It seems also true that the closure against water is only partial, since the lower bearing of defendant's apparatus is not within the enclosing casing, though the intermediate and top bearings are. So it seems doubtful whether the defendant's pump casing keeps the water from the shaft and bearings when it is not in operation, and the argument is that in the rice country, where it is principally used, it remains out of service nine months of the year. For these reasons, it is argued that the defendant's casing is not a closed one, even against water and sand. However, the record shows that protection against water and sand is afforded by defendant's casing to all but one of the bearings and to the shaft in the same degree as by that of the patented casing, at least during the period of the pump's operation, and that the protection afforded by defendant's casing is different only in degree from that afforded by the patented casing."*

INFRINGEMENT IS NOT AVOIDED BY IMPAIRMENT OF THE  
FUNCTIONS OF AN ELEMENT IN DEGREE

It will be noted the Court held it immaterial that the Van Ness shaft enclosing casing did not afford *as complete protection* as did the Layne casing. This finding is in accord with numerous decisions to the



effect that "Infringement is not avoided by impairment of the functions of an element of a patented device *in degree* . . ."

*Kawneer Mfg. Co. vs. Detroit Show Case Co.*,  
240 Fed., 739.

As said by now Chief Justice Taft in the case of *King Ax Co. et al. vs. Hubbard*, 97 Fed., 795, 803, Judges Lurton and Severens concurring:

"This is an instance, not infrequent in patent litigation, where the infringer has sought to evade the claims of a patent, the *substance* of which he is appropriating, by deliberately *impairing the function* of one element, without destroying the *substantial* identity of structure operation, and result. *Sewall vs. Jones*, 91 U. S., 171; *Coupe vs. Weatherhead*, 16 Fed., 673; *Machine Co. vs. Binney*, 24 Fed. Cas., 653."

It is to be noted, however, that it is when the pump is in operation that the bearings need protection from the destructive action of the sand and detritus carried by the water being pumped.

When the pump is idle, the water in the well is in a relatively quiescent state and, therefore, the sand and detritus therein *settles* so that any water, which might get into the shaft casing during such periods of idleness, would not carry such destructive detritus. Furthermore, the sand and detritus will wear and cut out the bearings and shaft *only* when the shaft is *rotating* during the pump's operation. When the shaft

is *not* rotating and the water is practically quiescent, there could be no wearing or destructive action by the detritus. Furthermore, the lubricant adhering to the shaft and bearings after cessation of operations, would sufficiently protect same from corrosion by any water that might slowly seep into the casing during non-operating periods.

It is, for the foregoing reasons, that the said Court of Appeals, in the *Van Ness* case, held the Van Ness pump embodied the substance of Layne's protective feature because, when operating, the Van Ness shaft enclosing casing, *in co-operation with the downflow of lubricant therein*, effectually excluded the water being pumped and the detritus carried thereby. In other words, as said in substance, by this Court, in *Sewall vs. Jones, supra*, to constitute infringement it was not necessary for Van Ness to employ Layne's invention *to as good advantage as Layne employed it* or that the result should be the same *in degree*. Furthermore, if Van Ness had seen fit so to do, he could have continued the feeding of the lubricant during the pump's idle periods, in which event *the downflow of lubricant*, in co-operation with the shaft casing, would have continued to exclude all water and detritus precisely as during operating periods. Layne's means were present for accomplishing such a result.

Continuing its discussion of the Van Ness closure, the said Court of Appeals said:

"The closure in the *patented* casing is effected

by stuffing boxes *as well as by the presence and downward pressure of the oil between the bearings and the shaft*, which serves to keep the water from pressing upward into the shaft casing between the bearings and the shaft. The closure in defendant's casing is effected *by the last method only*, and without the use of packing or stuffing boxes. Each casing serves to effect at least a partial closure against the water and sand. The difference is one of method and *degree* only, and for that reason it seems that the defendant's casing infringes this element of the patent, at least to some extent."

The foregoing *finding of fact* fully confirms the correctness of Mr. Layne's testimony herein (R. 606) to the effect that, in the Layne patented structure, the water and sand are excluded from the shaft enclosing casing by

1. Mechanical means "*helped*" by the co-operation of the
2. *Downward flow and pressure of the lubricant.*

It will be noted, the said Court of Appeals found that, in the Van Ness structure, the water and sand were excluded.

2. "By the last method only," to wit: *the downward flow and pressure of the lubricant.*

However, we believe the Court simply meant, by so finding, that the Van Ness structure did not embrace packing or stuffing-boxes, but did embrace, as is obvious, *the long sleeve bearing*, in co-operation with which *mechanical means* the downward pressure of the lubricant could exclude the water and sand.

In the *Van Ness* case, the defendant produced proofs showing that the lower thrust bearing rested on its seat on the brass bushing only during the installation of the pump. The shaft was then raised and adjusted so such contact between this bearing and the brass bushing was eliminated. The testimony on this point is quoted on page 74 of the *Van Ness* brief and reads as follows:

"A. The lower thrust bearing as shown on that drawing (heretofore reproduced herein) does not operate when the pump is in operation. It is put on that pump solely for the means of acting as a stop and when the pump is ready for operation this lower thrust or stop bearing is raised from the bushing and the thrust is placed on the ball thrust bearings at the top of the pump and being placed there by the top adjusting nut, as shown. The thrust is transmitted through the pulley through this thrust bearing."

The foregoing shows this thrust bearing *in no way* aided the *downward pressure of the lubricant* in excluding the water and sand. That the Court accepted this proof as *correctly disclosing the operation* of the *Van Ness* pump, is clearly indicated by its finding that "The closure in defendant's casing is effected by the *last method only*, and without the use of packing or stuffing-boxes." The "*last method*" was described by the Court as "*the presence and downward pressure of the oil between the bearings and the shaft, which serves to keep the water from pressing upward into the shaft casing between the bearings and the shaft.*"

(b) *Lubrication in Van Ness Pump*: Regarding the lubrication employed in this pump structure, the Court of Appeals said:

"The second function of the *patented* casing is that of providing lubrication for the bearings. In *both casings*, that of defendant *as well as that of complainant*, the oil is put in the apparatus *at the top and passes through the bearings from the top through the intermediate to the lower bearing*, being retained for a time above each bearing and serving in this way not only to lubricate each bearing, *but also to help close the shaft casing against the ingress of water and detritus*. The defendant's casing and that of the patent in suit perform this function to substantially the same extent, though the respective bearings as to the means for the flow of the oil through them are somewhat differently constructed."

It is obvious, said downward flow and pressure of the lubricant in Layne's patented casing could not "*help close the shaft casing against the ingress of water and detritus*" unless such lubricant was *able to enter and pass down between the shaft and the lowest shaft bearing and between the shaft and stuffing in box 40*, at which points the water and detritus would tend to enter the said shaft enclosing casing. If the lubricant passed between the shaft and such bearing and stuffing, it would then enter the pump casing containing the pump impeller, precisely as Mr. Layne testified herein.

It is to be noted that the shaft enclosing casing, so

far as lubrication is concerned, merely functions as a *conduit for the lubricant*. In the respective structures of Layne, Van Ness and respondents' herein, the lubricant is fed into the top of the shaft casing which merely acts or functions as a *conduit* down which the lubricant flows.

After the lubricant has passed down, in such conduit or shaft casing, through each of the bearings therein, *it has completed its lubricating function*. It is quite immaterial what then becomes of it. In such lubrication of the bearings, the shaft casing functions merely as a *conduit* and, therefore, such "*conduit function*" is completely performed by it in respect to any lubricant that has passed through all of the bearings. It is, therefore, quite immaterial, so far as concerns the performance of such conduit function, what becomes of the lubricant after it so passes through the casing.

*Nevertheless, the finding of non-infringement herein was based wholly upon the fact that some (not all) of the lubricant escaped from the bottom of respondents' shaft casing.*

In the first place, the lubricant passes through Layne's shaft casing and escapes from the bottom thereof through the stuffing-box into the pump casing, just as the proofs show and just as the Court of Appeals for the Fifth Circuit, in the *Van Ness* case, held and just as Judge Dietrich herein found to be the fact.

In the second place, if such were not the case, nevertheless infringement would not be avoided by any such immaterial variation in respect to an immaterial feature. Layne's patent is not on a process of lubrication but covers a structure, in which one element operates *as a conduit for the lubricant*. What becomes of the lubricant after passing through such conduit is immaterial. There is no pretense to the contrary.

The broad and *revolutionary* Layne invention does not depend, in respect to novelty, patentability, mode of operation and results accomplished, upon any such practically immaterial and minor characteristic *as the ultimate disposition* of the lubricant after it has performed its *twofold function* of lubricating the bearings and helping to exclude the water being pumped and the detritus carried thereby.

In the *Layne vs. Getty* case, the Court of Appeals for the Fifth Circuit found, *as a fact*, that

"The Layne patent . . . did accomplish a *revolution* in the well-drilling industry."

Certainly this *revolutionary* invention, to use the words of Judge Gilbert in *Parker vs. Stebler*, 177 Fed., 210, "*marked a distinct step in advance, whereby a notable success was achieved.*"

It can properly be designated as a "*pioneer improvement*" which stands *at the head* of a *new class* in this art. Being of such a *generic* character, the

*generic* claims in suit should be accorded a liberal construction and held to cover every *species* within the *genus*.

(c) *Alinement of Bearings in Van Ness Pump*:  
Regarding this feature, the Court of Appeals said:

"The third function performed by the shaft casing of the patent in suit is that of *aligning the bearings and the pump shaft* so as to keep the latter in a vertical position in the well. In the absence of intermediate support, the tendency of the shaft, if suspended only from the top, would be to swing laterally in the well, and so get out of alignment. This is corrected by taking advantage of the downward pressure of the shaft due to gravity, in connection with the intermediate bearings through which the shaft passes."

The Court found this feature present in the Van Ness pump which is, like Layne's, a structure *suspended* from the top of the ground—a *pendant structure not supported on the bottom of the well as was the Getty pump*. As said by the Court in the *Getty* case:

"It is also true that the Getty pump cannot be held to infringe the means that Layne used to keep his shaft properly aligned, since that was accomplished by *suspending* the mechanism from the top of the well, while Getty's pump mechanism receives its support *by resting on the bottom of the well*."

In such regard, the Getty pump departed from the Layne invention in respect to one of its dominating



and fundamental features. The great value of the Layne invention resides, in part, in the very fact that the structure, *concretely expressing said invention*, can be assembled, *unit by unit*, on the top of the ground and lowered, *unit by unit*, into the well, so that finally the whole structure is assembled and installed *suspended* from the top of the well like a plumb-bob, all without the necessity of man entering the well.

In the *Getty* case, the Circuit Court of Appeals for the Fifth Circuit, held the Getty pump structure not to infringe because of the differences between it and the Layne structure in respect to alinement, lubrication and protection. The finding of non-infringement, in that case, was not based on any one of said differences but upon the aggregate of said differences.

As said in the *Getty* case.

"Referring the closed shaft of Layne to the description in the specifications of his patent, as we must do, we think the differences from Getty's mechanism with respect to means of alinement, lubrication, and closure are so important that Getty's differing means should not be held to be mechanical equivalents, and should not be held to infringe the *closed* shaft of Layne's patent."

The difference between the Layne and Getty structures, first mentioned by the Court and particularly emphasized, is that the Getty structure is *not suspended* from the top of the well but is supported *on the bottom of the well*. On this point, the Court said:

"It is also true that the Getty pump cannot be held to infringe the means that Layne used to keep his shaft properly *aligned*, since that was accomplished by *suspending* the mechanism from the top of the well, while Getty's pump mechanism receives its support by *resting on the bottom of the well*."

The Court states that the El Campo pump (which was held *not* to infringe), was also *supported on the bottom of the well*.

As above mentioned, one of the dominating features of the Layne invention is the arrangement thereof whereby the structure may be assembled, *unit by unit*, on the top of the ground and lowered, *unit by unit*, into the well and, at the desired position in the well, held *suspended* from the top of the well.

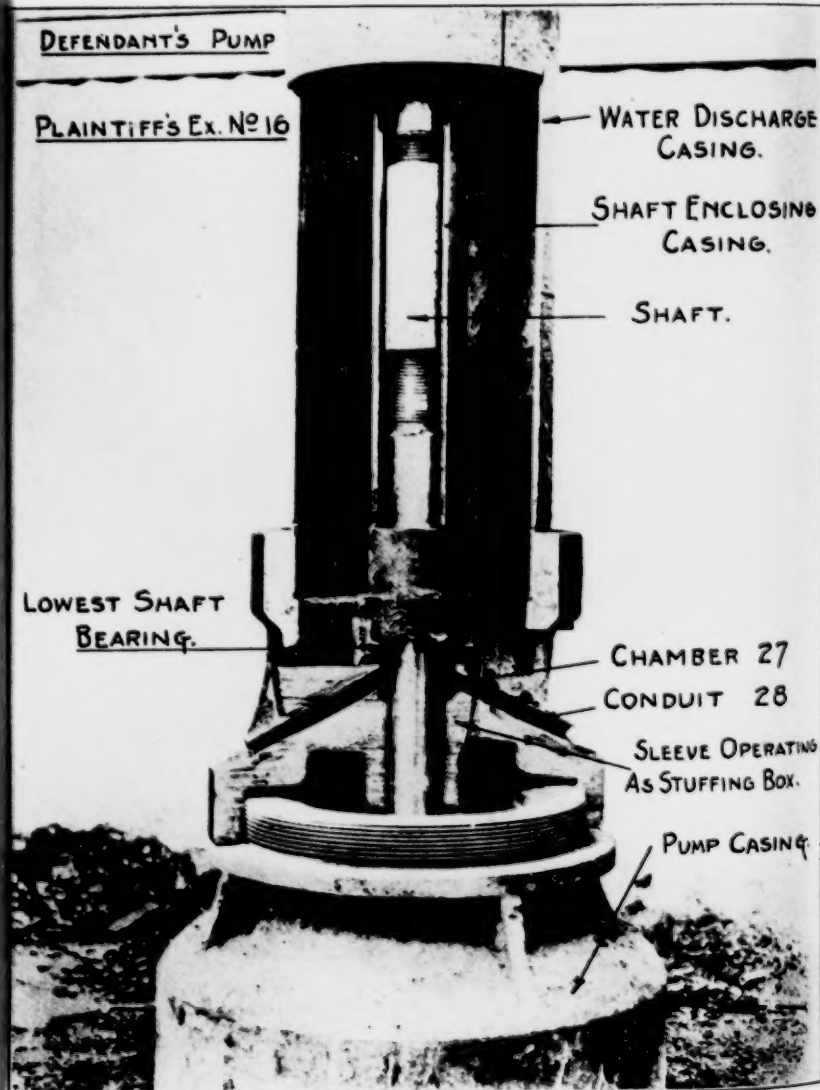
The Getty pump structure, being one *supported on the bottom of the well* and thus differing from Layne's *suspended* structure in respect to a dominating feature, was held by the Court not to infringe the Layne patent.

However, the pump structure of respondents' herein is suspended from the top of the well and is, therefore, in that respect substantially *identical* with Layne's structure and substantially *different* from the Getty structure as well as from the El Campo structure.

Another difference between the Layne and Getty structures, mentioned by the Court, is the *absence*, in Getty's structure, "*of physical obstruction*," at the

DEFENDANT'S PUMP

PLAINTIFF'S Ex. No 16



WATER DISCHARGE  
CASING.

SHAFT ENCLOSING  
CASING.

SHAFT.

LOWEST SHAFT  
BEARING.

CHAMBER 27

CONDUIT 28

SLEEVE OPERATING  
AS STUFFING BOX.

PUMP CASING.

bottom of the shaft enclosing casing, to the entrance thereto of water and detritus.

As said by the Court, " . . . Getty's partial closure is effected by balancing the pressure of the column of water outside the shaft casing against the pressure of the oil inside the casing, *without the use of physical obstruction.*"

In the respondents' structure, *physical obstructions*, embracing a long sleeve bearing (similar to the corresponding Van Ness sleeve bearing), and a sleeve (operating as a stuffing-box), are used for closing the bottom of the shaft casing. Said "*physical obstructions*" are disclosed in Plaintiff's Exhibit No. 16, reproduced on the opposite page and being a photograph of respondents' structure with portions thereof cut away to disclose the interior arrangement of parts. In said exhibit, the sleeve bearing is designated "Lowest shaft bearing" and the stuffing-box sleeve as "Sleeve operating as stuffing-box."

The said "*physical obstructions*" *in co-operation with the down pressure of the column of lubricant within the casing and tending to and escaping therefrom*, prevent any water and detritus entering the casing precisely as in the Layne and Van Ness pump structures.

No such physical obstruction was present in the Getty structure and, as a consequence, the lubricant flowed freely out of the casing and the water and sand could enter freely so far as physical obstruction was concerned. Mr. Getty's testimony on this point

is quoted in the Supplemental Brief filed in the Court of Appeals for the Fifth Circuit on his behalf. At page 7 of such Brief, his testimony is quoted as follows:

"I fully realized that in a pump construction such as mine, when the lubricant was permitted freedom of travel downward and out at the bottom of the shaft casing, that the water of the well would be equally free to enter the shaft casing from below, and the said water would frequently carry with it fine, sharp, cutting sand up through the bottom bearing, and that said bearing particularly, *and perhaps some of the bearings above*, would suffer from the cutting and grinding action of the sand. All this was fully anticipated while the pump was being planned, *but as I saw no remedy, I decided that such destructive action must be tolerated.*"

Mr. Getty evidently meant he saw no remedy other than by appropriating Mr. Layne's invention and, therefore, decided to endure the destructive action of the sand and water.

On page 9 of such Getty brief, the testimony of one G. E. Tarbox is quoted as follows:

"Q. 16. When you pulled this pump (Getty), what, if anything, did you find in the casing?

A. Nothing, excepting a very small quantity of water and sand.

Q. About how much sand?

A. About a handful.

Q. And whereabouts in the casing did you find this sand?

A. Immediately around the top of the bottom bearing.

Q. How long had this pump been in operation before you pulled it?

A. Why, the pump, as near as I can tell, was installed some time in February, 1914, and was pulled, I think it was, Sunday, June 20, 1915."

*A very different situation is presented by the Anderson pump, "Plaintiff's Exhibit 4," one of respondents' structures. An inspection thereof shows no water or sand have entered the casing; the bearings and shaft are bright and smooth and, when pulled and as it now remains, the shaft is covered with quantities of heavy grease which had remained in the casing from the time of the original installation of the pump.*

Obviously, there could be no free flow of lubricant through respondents' shaft enclosing casing and no free flow of water and sand into such casing. The proofs demonstrate the contrary. The heavy, *stagnant* lubricants which remain, *for years*, in the casing and on the shaft and above the bearings, would prevent even a free flow of the lighter emulsifying oil and certainly there is no free flow of such *stagnant* lubricants which remain in the casing for years.

The condition of the respondents' Anderson pump demonstrates that the "*physical obstructions*," aided by the lubricants, have excluded the water and sand. There is, therefore, a substantial difference between respondents' structure and Getty's in respect to *closure*. On the other hand, there is a substantial *identity* between respondents' structure and Layne's in respect to *closure*.

The third difference between the Layne and Getty structures, mentioned by the Court, was the continuous and free flow of oil through the Getty casing and out of the bottom thereof. The complete freedom of such flow is shown by the testimony of the witness Tarbox above quoted. On pulling a Getty pump, after a year and a half use thereof, he found only a little water and sand in the casing. *He found nothing else.* No lubricant remained.

The proofs show and respondents' witnesses and counsel admit that, *after years of use*, quantities of the *original* heavy grease, applied at the time of installation, remain in respondents' shaft enclosing casing and on the shaft and above the bearings and, as Mr. Doble testified, in the spiral grooves in the bearings. On this point, respondents' witness, Mr. Doble, Jr., said of respondents' Selby ranch installation:

"MR. WHITE—Q. Did you examine one of these spiral bearings, or grooves in the bearings?

A. I did.

Q. What did you find with regard to its condition?

A. It was filled with grease." (R. 819.)

With said *heavy grease* in the casing, on the shaft and in the spiral grooves of the bearings and thus being found *after years of use*, it is obvious that even the lighter, emulsifying oil could not flow freely through respondents' shaft enclosing casing.

As stated before, Layne's patent claims respectively

cover combinations of mechanical elements. One of said elements is the shaft enclosing casing, which is used as a *closure* against the destructive action of the detritus in the water being pumped; also, as a *means* of supporting and holding in *alinement*, the shaft bearings and shaft and also as a *conduit* through which lubricant may be applied to the bearings in series. In our opinion, it is *quite immaterial* whether or not the lubricant flows freely or otherwise. The claims do not cover a *method* or *process* of lubrication but merely a combination of mechanical elements of which one serves as a *conduit* for lubricants as well as performing other functions in respect to the work done by the combination as a whole.

The Court, in the *Getty* case, having found the Getty pump not to be a *pendant* structure and not embracing a *substantial closure*, evidently referred to the so-called "circulatory" lubrication as illustrating the absence of any substantial obstruction or closure at the bottom of the shaft enclosing casing. We cannot, for a moment, believe the Court would have found such Getty structure non-infringing if it had been *suspended* from the top of the well, and had embraced a substantial closure *which did protect the shaft bearings from the destructive action of the sand*.

In other words, closure at the bottom of the conduit must be sufficient to protect the shaft bearings from the destructive action of detritus. *But such bottom closure is immaterial as a feature of lubrication.*



When the lubricant reaches the bottom of the casing, it has completed its lubricating function.

However, there is no similarity between the Getty so-called circulatory system and the respondents' "stagnant" system in which the heavy lubricants remain in the casing *for years*. Also, the mere fact that *some* of the emulsifying oil and possibly *some* of the heavy grease, passes out of the bottom of the respondents' casing is immaterial. In the Layne structure, lubricant likewise passes out of the bottom of the casing. This fact is expressly found in the *Getty* as well as in the *Van Ness* cases. In the *Getty* case, the Court says that the Layne mechanical means *plus* "*the downward pressure of the column of oil in the shaft casing, accomplished his closure.*" Of course, the oil could not aid in excluding the water unless the oil itself was able to pass down the passage up which the water tended to flow. Layne's testimony herein is to the same effect (R. 604).

The sum and substance of this *Getty* decision is that the finding of non-infringement is predicated upon substantial differences in respect to *all three* of the functions performed by the shaft enclosing casing in respect to alinement, closure and lubrication. The decision is not based on any one difference but upon *all the differences*. It is the *aggregate* of the differences that prompted the Court to find the *Getty* structure to be substantially different from the Layne structure.

From the foregoing, it appears that the Circuit

Court of Appeals for the Fifth Circuit expressly found that Layne's patent was *not* limited to a shaft casing from which no lubricant escaped. In both the *Van Ness* and *Getty* cases, that Court expressly found that, in Layne's structure, the down pressure of the lubricant co-operated with physical obstructions in excluding the water from the shaft casing. And the lubricant could not do this unless it was able to pass from the casing down the passages through which the water tended to flow in an opposite direction into the casing.

Regarding such escape of the lubricant from Layne's shaft casing, Circuit Judge Gilbert's dissenting opinion is in full accord with the said decisions of the Circuit Court of Appeals for the Fifth Circuit in the *Van Ness* and *Getty* cases. Judge Gilbert found that:

"In both the appellee's (Layne) and appellants' mechanisms the oil is introduced at the top in substantially the same manner, and by gravity it traverses all the bearings. *In both there is some escape of oil through the lowest bearing*" (R. 1149).

Judge Dietrich, in the District Court, made a similar *finding of fact* which was *fully supported by the evidence*. Judge Dietrich's finding was thus expressed:

"Manifestly, if the oil is fed into the casing faster than it is dissipated, the vacant space will in time fill up and the column of oil thus formed

will press upon and have a tendency to escape out of the lowest bearing, thus co-operating with the stuffing-box in excluding water" (R. 890).

"In the actual operation of *plaintiff's* mechanism there is necessarily some escape of thin oil through the bottom bearing, for, as already explained, a perfect closure at this point cannot be maintained" (R. 895).

Notwithstanding such *finding of fact* by the District Court and the correctness of which Circuit Judge Gilbert affirmed, Circuit Judge Morrow and District Judge Wolverton reversed the same contrary to the ruling of this Court in *Adamson vs. Gilliland*, 242 U. S., 350, 353, wherein this Court said:

"Considering that a patent has been granted to the plaintiff, the case is pre-eminently one for the application of the practical rule that, so far as the finding of the master or judge who saw the witnesses depends upon conflicting testimony or upon the credibility of witnesses, or so far as there is any testimony consistent with the finding, *it must be treated as unassailable*. *Davis vs. Schwartz*, 155 U. S., 631, 636 (15 Sup. Ct., 237, 39 L. Ed., 289). The reasons for requiring the defendant to prove his case *beyond a reasonable doubt* are stated in the case of *The Barbed Wire Patent*, 143 U. S., 275, 284 (12 Sup. Ct., 443, 450, 36 L. Ed., 154)."

## III

## CONSTRUCTION OF LAYNE'S PATENT CLAIMS

One of the defenses, relied on herein, was that Byron Jackson, of San Francisco, was a "*prior inventor*" of that covered by the Layne patent claims in suit. *Respondents make no contention that Jackson ever built any anticipating pump.* The first pump made by him and claimed, by respondents, to embody Layne's invention, was not built until December, 1903, or January, 1904, almost *eight months after Layne's constructive reduction to practice* by the filing of his patent application on April 28, 1903.

Respondents' attorneys expressly disclaimed making any contention that Jackson ever made any anticipating pump. In respondents' Brief, filed in the Circuit Court of Appeals, their attorneys, at page 40, said:

"Let it be clearly understood at the outset that defendant does not contend that the Byron Jackson pump was *completed and operated* prior to Layne's filing date. Such 'completion and operation' are *not* necessary to a defense of *prior invention or knowledge.*" (Italics respondents.)

We shall discuss this Byron Jackson defense because, although *not* herein sustained by the Circuit Court of Appeals, it is referred to by Judge Morrow in construing the Layne patent claims *as being limited to a shaft casing from which no lubricant escapes.*

The same Byron Jackson defense was also held *not*

sustained in the case of *Petitioner vs. American Well and Prospecting Company et al., supra*.

The uncontradicted proofs show Layne conceived his invention as early as April, 1902 (R. 860; 868).

As Layne exercised *reasonable diligence* in filing, on April 28, 1903, his application for letters patent on his invention, the *date of said invention* must be deemed to be April, 1902.

Therefore, to sustain this Jackson defense, it was necessary for respondents to prove that, prior to April, 1902, Jackson conceived the same invention and, with *reasonable diligence*, either reduced the same to practice or filed an application for letters patent thereon.

However, respondents failed to introduce any proofs showing any completed "*conception*" by Jackson prior to the filing of Layne's application on April 28, 1903. Furthermore, respondents' proofs disclosed that Jackson never applied for letters patent on such invention and the first pump, made by him and claimed to embody Layne's invention, was not built by Jackson until *about eight months after the filing of Layne's application on which was issued the letters patent in suit*.

From the foregoing, it is apparent that, even though it were admitted, contrary to the proofs, that Jackson had a *mental conception* of said invention prior to Layne's conception, nevertheless Jackson could not be held to be a prior inventor *because he exercised no diligence* in reducing his mental conception to

practice and, therefore, could not be entitled to the *date of his mental conception* as the *date of his invention*. As said in Robinson on Patents, at page 150:

"Section 961. Third Defense: Denial that the Alleged Inventor was the first Inventor of the Patented Art or Instrument.

The third defense consists in a denial that the patentee or his assignor performed the inventive act producing the alleged invention *at an earlier date than any other inventors in this country*. This defense concedes that the patentee or his assignor is a true inventor of the art or article in question, but denies that he was its *first* inventor. It is equivalent to either of two averments: (1) That rival inventors had completely conceived the idea of means embodied in the invention, *and were using diligence in reducing it to practice* at the time when the patentee or his assignor conceived the same idea; or (2) that although the patentee or his assignor had *first conceived* the idea, *he did not use due diligence* in reducing it to practice, and that in the meantime some *later conceiver but more prompt reducer* had perfected the invention. This defense raises the same issue which is presented in interference cases in the Patent Office and in proceedings in equity to annul a rival patent, and is sustained when the evidence establishes either one of its equivalent averments."

As respondents made no attempt to fix the date of Jackson's conception by reference to any proofs showing a completed conception, petitioner's attorneys, in their Brief in the Circuit Court of Appeals, said:

"It is to be noted that defendants, in their Brief

do not attempt to point out *when* Byron Jackson had a complete conception of the Layne invention. Defendants do not refer to any written description, to any letter or to any drawing, completed prior to Layne's filing date or prior to the date upon which Layne's application was signed (April 3, 1903), from which the Court can find a completed idea or conception of the Layne invention."

Prior to referring to this Jackson defense, Judge Morrow, in his opinion, found, *contrary to the finding of the Circuit Court of Appeals for the Fifth Circuit*, that Layne's shaft casing did not perform the function of alining the shaft bearings and shaft. He then found that Jackson had a conception of the other features of the Layne invention excepting the alleged complete closure of the Layne shaft casing. In support of such finding, Judge Morrow quotes from numerous letters written *after* Layne executed his application for the letters patent in suit and in one of which letters, dated April 29, 1903, Jackson admits "*no such pump had been developed . . .*" This admission, alone, was sufficient to negative any contention that Jackson, prior to said letter or prior to Layne's application, had a *complete* mental conception of *any* proposed pump discussed in the letter. So far as Jackson was concerned, his ideas, at that time, were still inchoate.

Furthermore, it is to be noted that Judge Morrow, like respondents' attorneys, failed to point out *when* Jackson had a *complete conception* of *any* invention

and failed to refer to any written description, to any letter or to any drawing, completed prior to Layne's application date or prior to the date upon which Layne's application was signed (April 3, 1903), from which the Court could find a completed idea or conception of the Layne invention. Judge Morrow's views, in reference to the Jackson defense, were evidently based on what appeared in Jackson's letters written *after Layne had filed his patent application*.

Furthermore, Judge Morrow failed to discuss and apparently failed to consider the *question of diligence* in determining the *date* when Jackson could be said to have made a completed invention of any character. As said before, admittedly Jackson made no anticipating pump and did not make any pump, claimed by respondents to embody Layne's invention, *until about eight months after Layne filed his patent application*. And, in such *subsequent* Jackson pump, Judge Morrow did *not* find embodied the Layne shaft casing performing the function of alining the shaft bearings and shaft.

From the foregoing outline of the situation, it is apparent the Byron Jackson defense should have no effect on the scope of Layne's patent claims. The said defense was also overruled by trial Judge Dietrich and by Circuit Judge Gilbert. It was also overruled by the Master in the case of *Petitioner vs. American Well and Prospecting Company, supra*.

Judge Morrow's findings herein may be attributed to his confusion of the various and very differently



functioning casings mentioned in the Layne patent claims in suit. In his opinion, at page 1127 of the record, Judge Morrow made the following findings:

"We find also that the combination with a 'pump casing' mentioned in clause 2 of claim 9, the 'closed casing surrounding the pump shaft' mentioned in clause 5 of claim 9, the 'sectional casing' mentioned in clause 4 of claim 13, the 'casing being closed at the top' in clause 8 of claim 13, and the 'well casing' of clause 2, claim 20, by which the pump is 'entirely closed off from the water in the well' mentioned in the last two words of clause 4 and in clause 5 of claim 20, perform the same function . . . ."

In said quotation, *three* separate and distinct casings, respectively performing entirely different functions, are spoken of as being *one and the same thing and performing the same function*.

The "pump casing," of Claim 9, is numbered 21 in the Layne patent and, as clearly shown in Figure 1, is the casing that encloses the pump impellers. Obviously, said casing is not closed off from the water in the well. In order to operate the pump, the well water is permitted to enter the bottom of said casing 21 and said water, by the rapid rotation of the impellers within said casing, is forced out of said casing and up through the water discharge pipe 23 to the surface of the ground.

The "closed casing," of Claim 9, is the shaft enclosing casing numbered 20 in the Layne patent. This casing is supported at the top of the well and

hangs pendant therein, like a plumb-bob. So hanging in a vertical plane, it maintains in vertical alinement the shaft bearings mounted therein and thus maintains the shaft in vertical alinement. This casing also forms a conduit down through which the lubricant passes and lubricates, in series, the said shaft bearings. This casing also prevents the water and sand therein from coming in contact with the shaft bearings and thus destroying them.

The "well casing," of Claim 20, is numbered 16 in the Layne patent and forms an inner lining for the well bore to prevent caving in of the ground surrounding the bore of the well.

In the above quotation, His Honor, Judge Morrow, has erroneously treated these three separate and distinct casings as one and the same thing. Therefore, in construing Claims 9, 13 and 20, he has treated these *three distinct elements* thereof *as being only one element*. This confusion of these various elements may have been the reason for much of the conflict between the Circuit Court of Appeals' decision herein and the various prior decisions of the Circuit Court of Appeals for the Fifth Circuit.

## CONCLUSION

The Layne patent is now being extensively infringed and numerous suits, *in different circuits*, are pending against infringers thereof. In the *Ninth Circuit*, the Layne patent does *not* cover and, in the *Fifth Circuit*, *does* cover a structure embracing a shaft casing from which lubricant escapes from the bottom thereof. It is, therefore, in view of the said conflicting decisions of the respective Circuit Courts of Appeal for the Fifth and Ninth Circuits, important that this Court adjust and determine such conflict by herein rendering a decision definitely determining the scope to be accorded, in *all* circuits, to the Layne patent claims.

Upon the case made out in the petition, it is respectfully submitted that the writ of certiorari addressed to the Judges of the United States Circuit Court of Appeals for the Ninth Circuit should be issued as prayed.

FREDERICK S. LYON,  
WILLIAM K. WHITE,  
LEONARD S. LYON,  
*Counsel for Petitioner.*

## NOTICE

To Messrs. Chas. E. Townsend and Wm. A. Loftus,  
Counsel for Respondents.

Gentlemen:

You will please take notice that on Monday, the 13th day of March, 1922, at 12 o'clock noon, or as soon thereafter as counsel can be heard, the foregoing Petition and accompanying Brief will be submitted to the Supreme Court of the United States at its usual place of holding its sessions in the Capital at Washington, D. C., for its consideration and action at which time and place you will please take such action in the premises as you may be advised.

FREDERICK S. LYON,  
WILLIAM K. WHITE,  
LEONARD S. LYON,  
*Counsel for Petitioner.*

## ADMISSION OF SERVICE

Service of a copy of the foregoing Petition, Brief and Notice is acknowledged this 16th day of February, 1922.

CHAS. E. TOWNSEND,  
WM. A. LOFTUS,  
*Counsel for Respondents.*

fringements of petitioner's patent and directed an accounting. The Court of Appeals found no infringement and for that reason ordered that the bill be dismissed.

*Mr. Frederick S. Lyon*, with whom *Mr. William K. White* and *Mr. Leonard S. Lyon* were on the briefs, for petitioner.

*Mr. Chas. E. Townsend*, with whom *Mr. Frederic D. McKenney* and *Mr. Wm. A. Loftus* were on the briefs, for respondents.

*Mr. David P. Wolhaupter*, *Mr. Raymond Ives Blakeslee* and *Mr. Charles C. Montgomery*, by leave of court, filed a brief as *amici curiae*.

MR. CHIEF JUSTICE TAFT delivered the opinion of the Court.

This is an ordinary patent case. There was no reason for granting the application for a writ of certiorari except upon the ground that the Circuit Courts of Appeals for the Fifth and the Ninth Circuits had differed in respect to the validity and scope of the patent and that uniformity required a decision from this Court. The arguments and the briefs have aroused further inquiry in the minds of the Court as to whether there was in fact any conflict between the decisions of the two circuit courts of appeals, and whether the writ of certiorari was not improvidently granted.

The Layne patent, now owned by the Layne & Bowler Corporation, the petitioner, was for apparatus for drawing water from deep wells, driven or artesian, and especially for adjusting a pump in them. In such wells, it is essential that the adjustment, the alignment and the lubrication should be effected from the top because the bore of the well is so small that the operator can not descend to the pump. The Layne patent covered many

different devices for assembling the various parts at the top so that they could be thrust down the well hole and be adjusted in place at the bottom, so that the shaft of the rotary pump should be held in proper alignment as it rotated, so that it should not be clogged with sand and water as the pumping went on, and so that the shaft and the bearings in which it moved, placed at intervals from top to bottom, should be lubricated. To effect these objects the inventor used a casing or cylinder surrounding the shaft, divided them both into sections, united one section to another by a sleeve or screw thread and in these sections pushed the apparatus down the well hole. There was a bearing at each end of each section of the casing in which the shaft was to revolve. Layne assembled with this shaft and casing, wedges and spiders to hold the two in place against the sides of the well hole. The rotary pump was held suspended in alignment by the weight of the casing and was closed from the casing by a packed bushing in which the shaft revolved and which prevented water and sand and other detritus from clogging the shaft and its bearings. The water from the pump was carried to the top by a separate pipe. The lubrication was effected by pouring the oil in at the top of the casing, and allowing it to leak through each bearing to the bottom of the casing whence it was drawn at intervals out of the casing by forcing air through an air vent at the top of the casing. The pump with the rotary shaft was old, the use of sections was old generally though it does not seem to have been applied in this particular field before, and the closed casing or cylinder surrounding the shaft was old. In a prior patent to Crannell for a pump in wells large enough to permit a man to go to the bottom, a rotary shaft with a cylindrical casing closed against the pump is shown.

In practice, Layne did not use packing and bushing but relied on a long sleeve to keep water and sand out of the

casing. Nor did he ever use the wedges and spiders for alignment.

The three claims sued on in this case were Nos. 9, 13 and 20, as follows:

9. In a well mechanism, the combination with a pump casing of a rotary pump of a jointed pump shaft and a closed casing surrounding the pump shaft from the pump to the top of the well.

13. The combination with a pump and its actuating shaft of a sectional casing therefor, provided at each end of each section with a fixed block with bearings for the shaft, the casing being closed at the top and provided with an air vent.

20. The combination of a well casing, a rotary pump therein, and a line shaft for the pump entirely closed off from the water in the well.

In 1912, in an infringement suit the validity of this patent and of claim No. 13 was considered by the Circuit Court of Appeals of the Fifth Circuit and sustained. Infringement by defendant of that claim was found and a decree for damages entered. *El Campo Machine Co. v. Layne*, 195 Fed. 83. The decision is a *per curiam* and there is no discussion and no description of the defendant's device in the report.

In 1914, the same Circuit Court of Appeals had to consider the patent again in *Van Ness v. Layne*, 213 Fed. 804. The claims relied on were the 4th, the 9th, the 13th and the 20th. The 4th was found not to be infringed, and as we are not concerned with it here, we can disregard it. The court found that Van Ness, the alleged infringer, did not use an air vent to force his oil out of the casing as we are informed by this opinion the infringer El Campo had done in the previous case. So it was held that Van Ness did not infringe claim No. 13. The court held that the jointed feature of the shaft made part of claim 9 added nothing to the novelty or patentability of

the device and that claims No. 20 and No. 9 really covered the same ground. The court held, however, that the use of the entirely closed casing to exclude water and detritus from the shaft and its bearing, to secure lubrication of the bearings from the top and to align the bearings and shaft so as to prevent lateral displacement in the well and keep the shaft in a vertical position was a novelty and did supply a want in the field of deep pumps. As to infringement the court held that the casing of Van Ness's apparatus, although not so completely as the patented device, did keep the water and detritus from all the bearings but one on the shaft; that the lubrication was effected in practically the same way, and, though this was very doubtful in the mind of the court, the alignment was preserved by the downward thrust of the suspended casing and bearings. Accordingly it was held that the 20th claim was infringed.

In *Getty v. Lane*, 262 Fed. 141, the same court considered the patent a third time. In its opinion, it said (p. 143):

"The Layne patent too nearly resembles the Crannell patent to be called a pioneer patent, though it did accomplish a revolution in the well-drilling industry. Its merit was in adapting the Crannell type of pump to a narrow and deep well hole, in a way that has been held by us to exhibit novelty. While the substitution of mere mechanical equivalents for the means adopted by Layne could not avoid infringement of his patent, it is also true that the range of equivalents cannot be enlarged upon the idea that his patent was a pioneer one in the pump art. Its advance over Crannell prevented Crannell from being considered by us an anticipation, and was enough to show novelty, but it stops there. The Layne patent must rest, not upon the idea of closure, which would not be patentable apart from the method by which it was accomplished, but upon the means of its accomplishment, as disclosed by the specifications of his patent."



The court then held that alignment in the alleged infringement was secured by resting on the bottom of the well and not by suspension from the top and the downward thrust of the weight. It further held that Layne effected his lubrication by stagnant oil removed by forced air at intervals, whereas the alleged infringer had a circulatory system by which the oil after leaking through the bearings escaped from the bottom into the water around the pump, and that finally the closure of the casing against water and detritus was effected not by a bushing or packing but by the downward flow of the oil. This led to a dismissal of the bill.

The Circuit Court of Appeals of the Ninth Circuit in this case instead of differing from that of the Fifth Circuit, seems, on a careful examination of the opinions and the infringing devices under consideration in the different cases, to have followed the opinions in the Fifth Circuit. It sustained the validity of the 9th, 13th and 20th claims. It did not greatly consider the 13th claim because it was as clearly not infringed by the respondent here, as it was not infringed by the Van Ness device in the Fifth Circuit case. The Ninth Circuit Court held as the Fifth Circuit Court had held in the *Getty Case*, that the scope of the Layne patent claims was much restricted by the prior art and that a circulatory system of lubrication was not the same as a closed stagnant system. The entirely closed casing as an element of the 20th claim furnishing a stagnant lubrication did not, therefore, find its equivalent in the casing of the respondent which was open at the bottom to permit a circulatory lubrication.

It is manifest from this review of the conclusions in the two circuits as to the validity of the Layne patent and the proper construction to be put upon the 9th, 13th and 20th claims, that they were really in harmony and not in conflict and that there was no ground for our allowing the writ of certiorari to add to an already burdened

docket. If it be suggested that as much effort and time as we have given to the consideration of the alleged conflict would have enabled us to dispose of the case before us on the merits, the answer is that it is very important that we be consistent in not granting the writ of certiorari except in cases involving principles the settlement of which is of importance to the public as distinguished from that of the parties, and in cases where there is a real and embarrassing conflict of opinion and authority between the circuit courts of appeal. The present case certainly comes under neither head.

Precedents for dismissing a writ of certiorari improvidently granted are found in *Furness, Withy & Co. v. Yang-Tsze Insurance Association*, 242 U. S. 430, and in *United States v. Rimer*, 220 U. S. 547.

*Writ of certiorari dismissed.*

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LAYNE & BOWLER CORPORATION *v.* WESTERN  
WELL WORKS, INC., ET AL.

CERTIORARI TO THE CIRCUIT COURT OF APPEALS FOR THE  
NINTH CIRCUIT.

No. 278. - Argued March 5, 1923.—Decided April 9, 1923.

A writ of certiorari, issued to settle a supposed conflict of decision between two circuit courts of appeals concerning the validity and scope of a patent, will be dismissed, as improvidently granted, when later examination proves that such conflict did not exist. P. 392.

Writ of certiorari to review 276 Fed. 465, dismissed.

CERTIORARI to review a decree of the Circuit Court of Appeals reversing a decree of the District Court which enjoined the respondents here from acts found to be in-